

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

VOL. XVII. NO. 10.

MAY 15, 1889.

PEACE ON EARTH
GOD WILL FAVOR MEN



CLEANINGS
IN
BEE CULTURE

DEVOTED
TO
BEEKEEPING

& HOME INTERESTS.

MEDINA, OHIO

BY

AL ROOT

TERMS, ONE DOLLAR PER YEAR.

FRANKING, DUNCKER, C.S.

S W Conrad

ENTERED AT THE POSTOFFICE, MEDINA, OHIO, AS SECOND-CLASS MATTER.

GLEANINGS IN BEE CULTURE.

YOUNG AMERICA

LAWN MOWER.

The cheapest machine offered anywhere. Many prefer them to one with two drive wheels because they run so easily, and are so light. They are just right for running among the hives. For the ladies who appreciate outdoor exercise you could have nothing better than a 10-inch Young America lawn-mower to keep the grass down on the lawn. We have sold over 200 of them but never before have we offered them so low. Write for prices on quantities if you can use more than one of either kind.



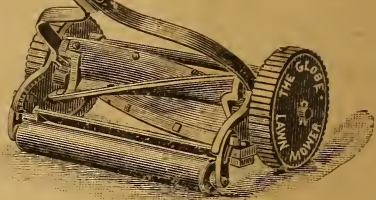
10 IN. \$3.50; 12 IN. \$4.30; 14 IN. \$5.

THE GLOBE LAWN-MOWER.

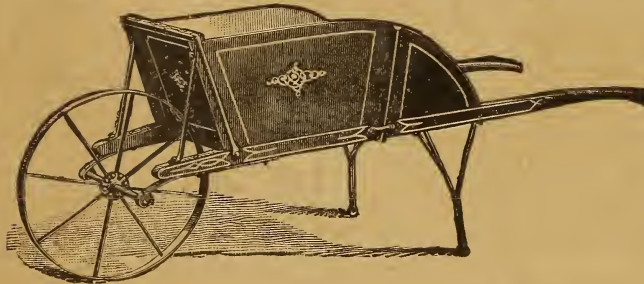
Guaranteed a First-Class Machine. The Globe lawn-mower shown in cut combines all the best features, and is a first-class mower in every respect. Having only three knives it will cut longer grass than those having four. The axle of the drive-wheel does not project, so that you can run close to the hive. It has two drive-wheels and roller, and the driving gears are simply perfect. The prices are very much lower than on any other first-class mower.

TABLE OF PRICES:

	LIST PRICE	OUR PRICE
10 in. Globe....	(\$13.00)...	\$4.90
12 " "	(15.00)...	5.70
14 " "	(17.00)...	6.50
16 " "	(19.00)...	7.20
18 " "	(21.00)...	8.00



OUR DAISY WHEELBARROW.

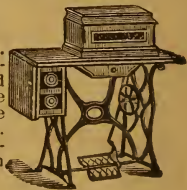


Who has not felt the need of a **Light, Strong, and Durable**, and at the same time **Cheap** wheelbarrow? The cut shows one that combines all these qualities better than any other we have ever seen. We have two sizes—the smaller one weighing only 35 lbs., and yet it will carry 500 lbs. safely, and it can be packed so closely together for shipment that you can take the whole thing under your arm and walk off easily. The wheel has flat spokes instead of round. The legs are steel, so they will neither break nor bend, even if you bump them on the sidewalk.

The springs are oil-tempered with adjustable bearings, so the wheel will always run free. More than all, the wheelbarrows are the nicest job of painting and varnishing, I believe, I ever saw, for a farm implement. They are handsome enough to go around town with, and strong enough to do heavy work; and yet the price of the small size No. 3 is only \$4.00; the larger size No. 2 is \$4.25. Over 200 sold in 8 months.

SINGER SEWING-MACHINE, \$11 TO \$16.

Made from latest models; first class in every respect, and warranted for 5 years. A boon to many an overworked housewife who can not afford to pay the price usually asked by agents. Cut shows No. 3. No. 1 is the same without the cover, leaf, and two drawers. Price \$11.00. No. 2 has a cover, but no leaf or side drawers. Price \$12.50. No. 3, as shown in the cut, price \$14.00. No. 4, same as No. 3, with 2 more drawers to the right. Price \$15.00. No. 5 has 3 drawers on each side. Price \$16.00. Wood parts are oil polished, walnut; balance-wheel is nickel plated, and each machine includes a full set of attachments, with instructions for use. We ship them direct to customers from factory in Chicago.



BUCKEYE SASH-LOCK.

A DEVICE TO FASTEN WINDOWS UP OR DOWN AT ANY POINT.

For many years I have been trying to get something better to hold a window up than a stick or book, or something of that sort; but although we have tried them, even paying as high as 75 cts. per window, I have never had any thing please me so well as the one here shown. This device holds the sash securely by friction in any desired position, as tight as if it were in a vise. It prevents the sash from rattling, and excludes the dust by making tight joints, and yet it does not mar the wood. It is put on with two screws, and can be fitted by an inexperienced hand in three minutes. It works equally well on upper or lower sash, with or without weights. Printed instructions are furnished with each one, as well as screws to fasten them on with, and yet the price is only 5 cts.; 1 doz. for 50 cts.; 100 for \$4.00. If wanted by mail, add 3 cts. each extra. The above are japanned.



A. I. ROOT, Medina, Ohio.

Contents of this Number.

Bees and Pollen.....	409	Hive-opener.....	414
Bees, Flight of.....	401	Hive on Scales.....	401
Bees, Settling Out.....	392	Honey Poisons.....	410
Bee-cellar, Green's.....	393	Huber, Francis.....	388
Bee-stings in Bees.....	413	Manum's Rules.....	391
Black Belt of Alabama.....	393	Mason's Statistics.....	399
Buckwheat Letters.....	395	Miller's Hive-stand.....	409
Caution to Parents.....	422	Mites.....	404
Combs, Movable.....	409	Moths, To Kill.....	414
Death from Honey.....	410	Muck.....	418
Denmark, Apiculture in.....	407	Orange-Blossoms.....	409
Doolittle's Book.....	423	Out-apiances.....	385
Doubling in 10 Days.....	402	Parthenogenesis.....	386
Drone Comb.....	405	Pigeons vs. Bees.....	401
Drones, Superseding.....	405	Potatoes in Illinois.....	417
Dwindling, Cause of.....	410	Pumpkin, Early.....	418
Editorial.....	433	Queens Hatched in 11 Days.....	410
Feeding in Cellar.....	418	Ramble No. 16.....	403
Flight of Bees.....	401	Reports Encouraging.....	413
Frames, Closed-end.....	387, 388	Stings and Rheumatism.....	409
Frames, Fixed.....	387	Swarming.....	(Q. B.) 412
Golden Hive.....	408	Swarming Impulse.....	(Q. B.) 411
Heads of Grain.....	408	Swarms, Hiving.....	(Q. B.) 411
Hill Device, New.....	413	Swarming—Two Acts.....	414
Hilton's Letter.....	408	Tarred Paper for Moths.....	391
Hives, Ornamental.....	406	Tumors, Winter.....	418
Hives, Heddon on.....	390	Wintering, Cellar.....	406
Hive-cart.....	410	Yellow Jessamine.....	410

FRESH-MADE FOUNDATION

I am still in the wax business, and will sell at the following prices:
 Heavy foundation, per lb35c
 Light, for boxes 45c
 Wax taken in exchange.
B. CHASE, Earlville, N. Y.
 10d In responding to this advertisement mention GLEANINGS.

2000 LBS. BEES
READY TO SHIP BY RETURN MAIL;
 Also 1000 lbs. Comb Foundation, and all kinds of supplies.
R. E. SMITH,
Box 72. Tilbury Center, Ontario, Can.
 In responding to this advertisement mention GLEANINGS.

Chas. A. Stockbridge, Fort Wayne, Ind.
 Manufacturer of and Dealer in
STOCKBRIDGE'S SIMPLICITY BEE NIVE,
 Sections, Frames, Smokers, Comb Foundation, &c.
 Mention this Paper. Send for Price List.

MUTH'S
HONEY-EXTRACTOR,
SQUARE GLASS HONEY-JARS,
TIN BUCKETS, BEE-HIVES,
HONEY-SECTIONS, &c., &c.
PERFECTION COLD-BLAST SMOKERS.
 Apply to **CHAS. F. MUTH & SON,**
 CINCINNATI, O.
 P. S.—Send 10-cent stamp for "Practical Hints to Bee-Keepers."
 (Mention Gleanings.) 1tfdb

THE HIVE AND HONEY-BEE, and DADANT'S FOUNDATION.
 See advertisement in another column.

SAVE FREIGHT.
BUY YOUR SUPPLIES NEAR HOME AND SAVE FREIGHT.
 We carry a complete line of Hives, Sections, Smokers, Honey Extractors, etc. Our motto, good goods and low prices. Sections in large quantities, only \$3.25 per M. Illustrated catalogue for your name on a postal card.
R. B. LEAHY & CO.,
 3-14db **Box 11. Higginville, Mo.**
 In responding to this advertisement mention GLEANINGS.

WANTED.—Jan. 1, 1887, number of GLEANINGS. Will pay 10c each. **A. I. ROOT, Medina, O.**

MY 21ST ANNUAL CATALOGUE OF ITALIAN, CYPRIAN, and HOLY-LAND BEES, QUEENS, NUCLEI, COLONIES, and SUPPLIES; also EGGS FOR HATCHING, can be had by sending me your address. **H. H. BROWN, Light Street, Col. Co., Pa.**
 Mention GLEANINGS. 10-11d

1000 Lbs. Bees with Queens and Brood.
Bee Supplies, Honey, &c. Price List Free.
Oliver Foster, Mt. Vernon, Linn Co., Iowa.
 Mention Gleanings. 7-10db

THE REVISED LANGSTROTH, and DADANT'S FOUNDATION.
 See advertisement in another column.

FOR SALE CHEAP.
200 HALF-STORY WIDE FRAMES, and 300 wide frames with tin, all as good as new, Simplicity sizes, will be sold to the highest bidder.
9-10d W. L. COGGSHALL, West Groton, N. Y.
 In responding to this advertisement mention GLEANINGS.

FOUNDATION.
 I MANUFACTURE COMB FOUNDATION. I have the latest improved machinery, and large experience. I think I can please you with quality of work. Circular free. **J. I. PARENT, Birshton, Saratoga Co., N. Y.** 9-10d
 In responding to this advertisement mention GLEANINGS.

CARNIOLAN QUEENS
 From imported mothers. Untested queens, \$1.00; tested queens, \$2.00. **J. B. KLINE'S APIARY,**
 7-10db Topeka, Kansas.

WE ARE NOW READY TO SUPPLY ITALIAN QUEENS to any person who wants as good as the best in the U. S. Reared from the egg, in full colonies. Tested, \$2.00; untested, \$1.00; 6 for \$5.00. Mismatched, 50 cts. Remit by Registered Letter or Money Order on New Market, Ala.
B. B. TONEY & CO.,
Padgett, Jackson Co., Alabama.
 In responding to this advertisement mention GLEANINGS.

LOOK HERE!
 I will sell fine colonies of pure Italian bees, with their queens, in 10-frame Simplicity hives, 10 frames all worker comb and hive new, well painted, and guaranteed to arrive at your express office in good shape. Prices: 1 hive, \$7.00; 2 at one time, \$13.00; 4, same, \$24.00. Remember the risk of shipping lies with me. Address **JNO. A. THORNTON,**
 Exp. office, Ursa, Ill. **Lima, Adams Co., Ill.**
 Mention Gleanings. 6-11db

B. J. MILLER & CO.,
NAPPANEE, IND.,
BEE-HIVES AND ITALIAN QUEENS.
 4¼x4¼ Sections, from 500 to 3000, at \$3.50 per 1000; if you want more than that, write for prices. Brood-frames, T-tin Cases, Foundation, and Metal Corners. Send for price list. 1tfdb
 In responding to this advertisement mention GLEANINGS.

Minorcan Queens.
 Very prolific, and tolerably docile. No foul brood known. Will be sent from April to October, by mail, on receipt of \$2 greenback in certified letter.
F. C. ANDREU.
 7-8-9d **Port Mahon, Minorca, Spain.**
 In responding to this advertisement mention GLEANINGS.

IGNOTUM TOMATO PLANTS
 A great lot of them, transplanted and well rooted, ready to go off by first mail. Prices, 3 for 10 cents; 10 for 25 cents, prepaid by mail. By express, \$2.00 per 100. **A. I. ROOT, Medina, O.**



Vol. XVII.

MAY 15, 1889.

No. 10.

TERMS: \$1.00 PER ANNUM, IN ADVANCE; 2 Copies for \$1.90; 3 for \$2.75; 5 for \$4.00; 10 or more, 75 cts. each. Single number, 5 cts. Additions to clubs may be made at club rates. Above are all to be sent to ONE POSTOFFICE.

Established in 1873.

PUBLISHED SEMI-MONTHLY BY

A. I. ROOT, MEDINA, OHIO.

Clubs to different postoffices, NOT LESS than 90 cts. each. Sent postpaid, in the U. S. and Canadas. To all other countries of the Universal Postal Union, 18 cts. per year extra. To all countries not of the U. P. U., 42 cts. per year extra.

OUT-APIARIES—NO. VII.

HAULING BEES; MANAGEMENT OF HORSES AMONG BEES.

I HAVE hauled a good many loads of bees—so many that I probably shall never get much more used to it than I am now; but I confess to you that I give a sigh of relief every spring when the last load is hauled, and the same thing happens in the fall. I'd like to impress this on your mind pretty strongly; for if you are not very careful you may get into such trouble that you will wish you had never had any thing to do with bees. I mean trouble in getting horses stung, for you need anticipate no special trouble if you move your bees by rail. I think I would rather not have a very fractious horse to haul bees, although if no bee ever gets out in any way, there is no more danger than in hauling so many boxes of potatoes. But I never expect to become such an adept at the business that occasionally a bee will not sting my horse, and I am not sure whether a horse becomes used to bees so that, after being stung a few times, he will care less for them, or whether he becomes more nervous about hearing them fly around him after experiencing their sting. I am more inclined to the latter view; so at such times I am quite willing to endure a horse that is lazy and not easily stirred up.

I am not sure whether all horses need the same treatment when attacked by the bees; but I suspect they do, from what little I have learned about others, and the experience I have had with two of my own. A bee attacks a horse at the head oftener than anywhere else, and his first impulse is to get to some post or tree where he can rub his head. A careless observer, seeing a bee attack a horse which is hitched to a wagon, would say that the first impulse of the horse is to run; but I think he tries to

run for the sake of getting to some object where he can rub his head. So when a bee stings a horse on the head, or even annoys it by flying about it, the first thing is to run to his head, and, with one or both hands and forearms, rub his head all over, unless you know where the sting is, and then you will do better to devote your attention to that particular spot. You say that a sting only pains worse to rub it. Never mind; we're not trying to save the horse pain, but to save him from running and smashing things. Let me caution you to look out that the horse does not knock you over with his head, for in trying to rub his head he will strike against you. If you are driving on the road, and a hive springs a leak, unhitch your horse as lively as you can; get him to a safe distance, and hitch him till you get every thing secure. I once had an old hive break so badly on the road, that the only thing I could do was to unhitch and take the team some distance ahead, unload the hive, and leave it on the roadside (till next morning), then draw the wagon a short distance by hand before hitching on. You know how persistently a cross bee will sometimes follow you around. Now, don't go near a horse till you have got rid of such a bee, even if you have to make a detour a long way around.

I have learned to be cautious with a horse, even if there is not a hive in the apiary. One fall, after all the colonies had been hauled home from the Wilson apiary, we went over to bring home the last load of empty supers. My wife and her sister were loading on the supers, and I was occupied at some distance when I was surprised to hear them calling out that the horse was being stung. Charlie had hauled home the last load of bees alone, and in an empty or nearly empty super that he had taken off one of the hives, there were a pint or so of bees. The horse was hitched with his head close to the pile of supers; and when this super was slightly lifted,

one or more bees came out, and the super was immediately shut down. But the horse began to plunge, and knocked the pile of supers over, when the bees poured out upon the horse. By the time I got there he was rearing and plunging, the bees all over him. Failing to untie him I took out my knife and cut him loose, when he threw himself flat on his side, fortunately breaking nothing, and refused to stir for my kicking. I stuck my sharp-pointed knife into his side, which perhaps he took for an unusually bad sting. At any rate, he sprang to his feet and started for a lively trip around the orchard, I hanging on by the bits, ardently wishing something might stop us, but pretty soon we stopped ourselves, pretty well tired out; and while I hung on, the others unhitched him from the wagon and I let him make a few circuits of the orchard, when I caught him and led him into the barn, very tired, very wet, and probably very sore, his head hanging down as if meditating on the uncertainties of piles of empty supers. I was in my bare head, and got one of the worst stings I ever had. All this is told to try to make you careful about bees and horses.

C. C. MILLER.

Marengo, Ill.

I am real glad that you have touched upon this matter of what to do with horses when they are stung by bees. I do not know but that I am wicked enough to feel glad that you got pulled around the orchard bareheaded, devoutly wishing that something might "stop us." It never occurred to me before that a horse, when stung by a bee, wants to rub his head against something; but since you mention it, I have over and over again seen horses act in just that way. Poor fellows! They have not any hands to grab the vicious bee, and all they can do is to rub their heads against something to keep the bee off. Yesterday I got quite vexed with old Charlie because he pushed his collar against the limbs of the apple-trees when he was cultivating. I finally surmised that his neck was warm and sweaty, and very likely he wanted to scratch, and he reasoned with horse sense that the limbs of our young apple-trees would do the scratching about as cheap as anybody. Poor fellows! I often feel a great deal of sympathy for them. They are harnessed up and made to go. They can not tell when they feel bad and uncomfortable. In fact, if they should undertake to tell, in any of the ways that dumb folks talk, they would get a sharp scolding, and may be a whipping. I shall certainly try to rub a horse's head whenever I see one stung again. In fact, I have often seen Meg, when a vicious fly got on her head, stop right in the road and turn around, and by means of vigorous nods fairly beg to have somebody get out of the buggy and kill the fly. I don't think it would make the sting hurt any worse on a horse to rub it. I have often felt impatient with drivers of horses because I could not get them to move lively when bees were in dangerous proximity. Once while harrowing close to the apiary a swarm of bees acted very much as if they were going to settle somewhere on the \$400 team. I yelled out to the driver to get his team out of the way with all possible dispatch. He first stopped to ask two or three

times what I wanted. Then he began leisurely to move the lever so as to lift the Acme harrow on to the wheels. By that time I got pretty much in earnest. I yelled out to him to start up his team and make tracks if he knew what was good for him. One second more, and there would have been trouble. The bees followed the team a little way; but when he got under way, the horses took him to a place of safety pretty rapidly. I have sometimes wished we had some arrangement to let the horses entirely loose from the vehicle by pulling a single lever. If we could get the horse loose from the wagon, there is not much trouble in getting him away from the bees, usually. Ernest here informs me that our friend A. E. Manum is a harness-maker, and that he already has something touching on this very matter, forthcoming shortly. Yes, friend M., we are all going to try to be more careful when we have horses among the bees. We thank you for your timely warning.

PARTHENOGENESIS.

PROF. COOK TELLS US HOW WE KNOW IT IS TRUE.

DEAR MR. EDITOR:—I have long known of Ullivi's views in regard to parthenogenesis, as stated by your correspondent, F. C. Andrew; and as he and you request, I will gladly give my reasons for thinking him mistaken.

First, for the younger bee-keepers, let me say that parthenogenesis, or agamic reproduction, means genesis or reproduction without males. That is, a female that has never met a male can produce young. This is illustrated in coral animals, where each alternate generation produces without males, and we call it then alternation of generations. Among insects it prevails in all the summer broods of aphides, or plant-lice. This any one can easily demonstrate. We have only to take a young louse, as soon as it is born—the eggs hatch within the mother-louse—and isolate it—that is, put it on a plant all alone. It will grow, mature, and produce many young lice. This louse has never seen any other louse, male or female, except its own mother, and that only for a brief natal moment. It would have been the same had we left it on its food plant undisturbed; for at this season—midsummer—there are no males at all. The separation was simply to demonstrate that parthenogenesis is a truth. In case of bees, parthenogenesis extends only to the production of the males, or drones; that is, if an unmated queen lays an egg, or if any queen lays an unimpregnated egg, that egg hatches, and a drone is the invariable result.

Now, I am sure that this is true science, and not mere theory. First, because such noted bee-keepers as Dzierzon and Berlepsch, and such able scientists as Siebold and Leuckart, in Germany, and such Americans as Langstroth and Leidy proved it. Again, I have also proved it. I have several times clipped a queen's wing so she could not fly, as soon as she came from the cell, and in no case but one did I ever secure any thing but a drone-laying queen. In many cases these queens were in hives or nuclei with no drones, and so guarded that the drones could not enter or the queens go forth. So Ullivi's statement, that they were impregnated in the hive, could not be true. But I have stronger

proof. It is very easy to tell with the microscope whether or not a queen has met a drone. If so, the very active sperm-cells are easily found. I have dissected these drone-laying queens repeatedly, and always failed to find the spermatozoa. They were not there. So I am positively sure that the queens never mated; and yet they produced drones, hence I know that parthenogenesis is true.

Again I have dissected fertile workers—several of them—and though they laid eggs, I even found eggs in their ovaries; yet all produced drones. Moreover, they had no spermatheca. True, the little rudiment, small and functionally imperfect, was present, but no sign of an active spermatheca. Ulivi says these are real queens, and have mated. It will be difficult to convince such apiarists as Viallon, of Louisiana, who sent me several fertile workers at one time, that these are queens. They have the form and general structure of workers throughout, except that they are fertile. From dissection I know they never had met, nor was it possible for them to meet a drone. They were not sufficiently developed. Many other insects, like ants and wasps, illustrate this law as exemplified in bees; while other insects, even as high as moths, have been known to produce eggs that hatched, and yet the moth had never been near a male.

The statement of Ulivi, that this theory is announced to favor breeders of queens, is not worthy of notice, certainly in America. Many, I think most of our queen-breeders, are men of high character, who would despise to misrepresent or deceive. To say that Dzierzon and Berlepsch proposed this theory with fraudulent purpose or intent, is very unkind and uncalled for. Both were grand men who would scorn such a thought even—men who thought no evil. Such insinuations need no refutation. Our bee-keepers are too intelligent to heed them for one moment.

Agricultural College, Mich.

A. J. COOK.

FIXED FRAMES.

FRIEND HEDDON CONSIDERS THEIR ADVANTAGES.

I WAS deeply interested in reading the answers to Query 117, which is as follows: "If you use all-wood frames, do you prefer to have them hung on metal rabbets or on a plain wood bearing, in the production of honey?"

I believe all who answered this question, did so honestly from their experience as honey-producers. A few years ago I should have answered it the same as the majority of them did, because I should have answered it from my standpoint of knowledge and experience at that time. Brother C. C. Miller says, "On a plain wood bearing. Then they are always ready to haul without fastening the frames." Brother Geo. Grimm says, "I use all-wood frames hung on wood bearings. Metal rabbets are a source of constant annoyance to me, and the few that I had I have discarded."

Now, friend Root, I am going to attack your foot-notes next, for you are also one of those fellows who pitch in among the answers. You say that a few have been bold enough to discard frames altogether, having a shallow brood-case something like Heddon's, and letting the combs be built in solid. Yes, sir, that was the very idea I had years ago, when I wrote an article for which you called me a box-hive bee-keeper, and made a box-

hive department, fully expecting that I would have that department to dance around in all by myself. That kind of a hive would have one splendid advantage. Having no bottom-bars in the way, how easily you could look into every thing! But you see with my new hive I have a § bottom and top bar, so I could get nearly as great an advantage in that direction. Well, by experimenting carefully with this and various other styles, I found I really did want the frames, especially where full sheets of foundation are used.

Nearly all of those who have answered this question contemplate pulling the frames out and in, very frequently. None of them contemplate a hive with which nearly every bit of the useful manipulation, such as the practical honey-producer desires, can be done without ever removing a frame. Another thing: The close-fitting frame, which they all have in their mind's eye, works upon an entirely different plan from the manner in which I use it. When father Langstroth visited me and practically handled my hive, he would not believe, before he had put it to the test, that he himself could handle eight of these close-fitting frames quicker than he or any one else could handle the suspended frame; but he found he could. He found an arrangement or adjustment of which he had not hitherto conceived. Let me give you the exact words of the grand old benefactor whose mind and conception of mechanics seems to be as bright as ever it could be. I quote from his article in the *American Bee Journal*:

1. Before I saw the easy working of his frames (EVEN IN HIVES WHICH HAD BEEN OCCUPIED FOR SEVERAL YEARS BY BEES), with close-fitting uprights (I prefer this French term to our word ends), I could not conceive how they could possibly be handled as rapidly or safely as the Langstroth frames. The propolis trouble alone seemed to forbid this. Judge of my surprise, then, to find, that, by leaving no space for bees to get between the uprights and the cases holding the frames, and by keeping the touching surfaces of the uprights so closely pressed together by the thumb-screws as to leave no joint open wide enough for bee-glue, he had actually reduced the propolizing propensity of bees to a minimum.

My knowledge of the trouble and delay in manipulating all the previous styles of close-fitting uprights, led me to think that it would be quite difficult to handle the Heddon frames. To find that I was mistaken on this point, was a greater surprise than the way in which the propolis difficulty was met. In handling Langstroth frames of the standard depth (and still more with deeper frames), bees are often hurt between the uprights and case—a thing impossible with the Heddon arrangement, while at the same time the uprights of his case—as they go down into the hive, when a frame is put back—only push the bees away instead of pinching them between their closing surfaces. When the Langstroth frames are put back, even by experts, it often happens that they must re-adjust the spacing, to get room for the last frame; whereas the Heddon frames always go to their proper places. As a matter of fact, then, the Heddon frames can be safely handled with more rapidity than any in previous use; thus securing all the advantages of close-fitting uprights without their old inconveniences.

It seems to me, friend Root, that the whole thing is summed up in this way: Bee-keepers who have educated themselves to the constant handling of combs, prefer the hives arranged as are tenements, and they want the metal rests, and laterally movable frames; but those who have found themselves compelled to handle 200 colonies of bees in the same length of time they used to handle 100, have found they must handle the hives more, and not open them so much. This is just what I found,

and what led me to the invention and construction of a hive with which I could accomplish all that the practical, successful honey-producer needed, and that, too, almost instantly, with scarcely ever needing to remove a single frame. That accomplishment meant closed-end frames; and when Dr. Miller and George Grimm mention the advantages of "hauling" hives of bees, and the "constant annoyance" of having frames rattling round, they have no idea what a comfort it is to use a hive with shallow, straight combs, with which the usual advantage of lateral movement plays no part. The hives can be carried in and out of winter repositories, as well as being handled every way with that security, safety, and convenience with which only fixed frames can be handled, and at the same time, when desired, each frame can be handled quicker than the suspended frames can be operated.

I am this day in receipt of a letter from M. M. Baldridge, which is only a sample of many others received, telling how much better his bees wintered in extremely shallow frames than in those of the Langstroth depth, or deeper. That is just my experience. The very shallow frames are the best for wintering, likewise for early spring breeding. The reasons for these facts are obvious; but this article is getting too long, so I will close by saying that, since the invention of comb foundation, and the arrangement and adjustment of frames as described above, the suspended frame has had its day, and will soon become obsolete with the practical honey-producer who feels himself compelled to produce his crop with the least possible outlay of labor, which is the main factor connected with the cost of honey production.

JAMES HEDDON.
Dowagiac, Mich., Apr. 9, 1889.

CLOSED-END FRAMES.

SOME GOOD ARGUMENTS IN THEIR FAVOR.

FRIEND ROOT:—I am glad to see you admit, in your comments on Questions 116 and 117, that there are good reasons why a honey-producer should prefer closed-end frames. No doubt it seems a wide departure from the metal-cornered frame hanging on metal rabbets, and it probably is difficult for one who has used only such frames to believe that an all-wood frame, with the ends jammed up close together, to be propolized by the bees, can be as readily handled. I remember when we were at the Chicago convention, in 1887, you asked me what kind of hive I preferred; and when I answered that I did not exactly know, only that I was sure of two things—that I wanted a shallow hive and one with the frames at fixed distances, a curious, half-doubting smile spread over your face as if you would say that you were afraid I was making a mistake. Well, I am very much of the same opinion yet. While I am sure that I want shallow, closed-end frames, I am not yet quite certain as to the best kind of a hive to make them into. I have experimented, and am still experimenting largely. As a result I am now using several different kinds of hives and frames, which is not so inconvenient as you may suppose, as the hives are all interchangeable in their parts; and when I decide which kind I like best, the others can all be changed to that with but very little trouble.

One advantage the closed-end frame has over the

hanging frame, as regards the time required to handle them is, that you waste no time or labor in spacing them; and another is, that fewer brace-combs are built between them, as the distance between comb surfaces is seldom varied.

I have known, ever since I have kept bees in these shallow fixed-frame hives, that my bees wintered better in them than in the deeper hanging frame; but I had always laid it to other reasons, for the most part. Since reading the answer of L. C. Root to Question 116 I am convinced that the closed-end frame deserves more credit for this than I had supposed.

You know I have always argued against upward ventilation in the winter and spring. This morning I was examining some of my colonies, just brought from the cellar, and it gave me great satisfaction to be able to stand the hives on end, or turn them upside down, thus learning all I wanted to know of their condition, without removing the cover or making any crevices around the top of the hive. I believe that, in the spring, when the weather is cold and propolis scarce, the less plastering we make the bees do, the better.

Of 116 colonies put into winter quarters, 31 of them in a cellar, the rest outside, all are at present in good condition but two, one queenless and one so weak it was united.

J. A. GREEN.

Dayton, Ill., Apr. 10, 1889.

FRANCIS HUBER.

HIS LIFE AND SERVICES TO THE BEE-KEEPING WORLD.

WE take the following very interesting sketch from Gravenhorst's *Illustrated Bee Journal*. It was written by Mr. T. Kellen, of Luxemburg. The translation is furnished by W. P. Root.

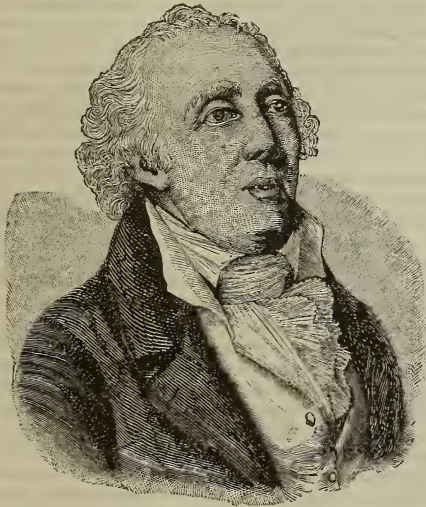
Francis Huber, by his investigations and researches in apiculture, did more to promote this science than all his predecessors who had employed themselves in the study of this interesting insect. It is his discoveries alone that marked that golden age in the history of apiculture which is destined to remain for all ages. Huber's observations are not only of the greatest importance of themselves, but wonderful for the manner in which they were made; for Huber was blind.

This distinguished man was born in Geneva, July 2, 1750. He was the son of a prosperous and respectable family, which as early as the 17th century were celebrated for their knowledge of the arts and sciences. His father, John Huber (born in 1722, died 1790), was well known on account of his attachment to the celebrated French philosopher Voltaire.

From his earliest youth Huber showed a passionate predilection for natural history, and he applied himself to study with such zeal as to endanger his health, so that at the age of fifteen the reflection of blinding snow destroyed his sight. If ever a man bitterly deplored the loss of eyesight, that man was Huber. But his misfortune did not hinder him from applying himself to the study of those insects for which he had an especial liking; namely, the bees. It was this little insect that turned the darkness of the investigator into day; for Huber was the first to see clearly into that domain which to the best eyes had previously remained in darkness.

Huber did not lose his vigor of mind, for he went

forward in the study of bees; but he could do this only by the help of his wife, Marie-Aimée Lullin; his niece, Miss Jurine, and, above all, his servant Burnens. He himself manifested the most untiring perseverance and the greatest ingenuity, so that, by Burnens' sagacity, all of Huber's experiments with bees were practically demonstrated. Miss Jurine, who loved natural history above all else, supplemented Huber's work all she could, fearing not to take up the dissecting-knife and microscope in his aid. She was the first after Swammerdam to demonstrate that worker-bees are females. She it was, too, who, with Huber, established the principles on which the sages of our century grounded the doctrine of parthenogenesis. Besides that, Miss Jurine was Huber's secretary, full of willingness and self-devotion. Every day she noted down the results of the new investigations, and she also wrote the letters which Huber dictated to Charles Bonnet and his friends, and imparted to him the results of his labors, and directed their attention to numerous questions relating to bees.



FRANCIS HUBER.

Huber's interest in bees was greatly enhanced by the researches and writings of Swammerdam, Reaumur, Schirach, and probably also of the celebrated Swiss bee-keeper, Duchet de Remauffens, and the Messrs. Gelieu. As a conclusion to the investigations of these men, it was possible for him, in spite of his unfortunate surroundings, to add greatly to the realm of apiculture; hence we may not forget that he everywhere encouraged and helped others by the nobility of his life.

In his later days he lived retired, but in peace, at Lausanne, where he died Dec. 22, 1832, at the age of 83.

Huber's discoveries are known to scholars through his letters to Charles Bonnet; and they made his name so celebrated in all Europe, and even in America, that for many years he was recognized as the greatest apicultural genius; and even yet Hamet calls him the greatest of the lovers of bees (*le plus grand des apiphiles*). It was in 1796 that his first epoch-making work was brought to light, bearing the title, *Nouvelles Observations sur les Abeilles* (New Observations on Bees). His son, Peter Huber, in

1814 issued the work in two editions, and added thereto an appendix in regard to the origin of wax.

Huber's work is, not only on account of its contents, but for the peculiar circumstances under which it was first brought to light, entirely without parallel in scientific literature. The recognition which it received was universal, so that, after the first appearance of the work, Huber was received into the French Academy of Sciences, and other scientific bodies.

The New Observations were translated into nearly every European tongue. The Saxon commissariat Riem, in Dresden, translated it into German in 1798, and Pastor Kleine, of Luethorst, translated it again in 1856, and published another edition in 1869, with notes.

Huber, by his observations on the secrets of bee-life, made clear what the most sagacious and learned observers from the time of Aristotle and Aristomachus down to Swammerdam and Reaumur had sought for in vain; and it is to be more regretted that some German bee-keepers of great influence, such as, for instance, Spitzner and Matuschka, gave him no recognition.

He gave interesting explanations in regard to the habits of bees, their respiration, the origin of wax, the construction of comb, etc. He confirmed Schirach's proposition, that, by a change in the mode of treatment and food of larval bees, queens could be reared from worker eggs, and showed, likewise, the influence which the cell exerted on the insects. He showed further, that not only the queen but a certain species of worker-bee could lay fertile eggs, and showed, likewise, the function of drones. In opposition to Braw, Hattorf, Contardi, Reaumur, and others, who held very peculiar opinions in regard to the fertilization of queens, Huber showed that the fertilization takes place outside of the hive, at the same time that drones are flying, and that the union is effected in the air, and that the queen, on her return from the flight, has adhering to her body the evidences of fertilization, and that egg-laying takes place about 46 hours afterward. These and numerous other experiments he often proved in his works with the utmost exactness; and especially did he lay down the most important and interesting information in regard to feeding bees, their method of building, the leaf-hive, foul brood, etc., in his letters to an eminent apiculturist in Switzerland, Mr. C. F. P. Dubied. These eighteen very long letters of Huber, the first of which was dated Oct. 12, 1800, and the last Aug. 12, 1814, were written partly by Huber himself, partly by his wife or daughter, to whom he dictated. So far as I know, this correspondence has never been translated into German, which is greatly to be regretted.

When one reads Huber's observations, it becomes evident that the author interested himself in bees, from a scientific standpoint only. In one of his letters to a friend, he writes that he never realized any material benefit from bees. This is easy to understand when we consider that his experiments with them lasted the entire year through, and were conducted only for the sake of science; and one naturally inquires how he found bees enough to carry out his numerous experiments.

Mr. Kellen here gives a picture of Huber's leaf-hive, which we will describe briefly in our own words, simply basing our figures on his.

Take, for instance, ten single-pane win-

dow-sash, about 13x20 inches. Stand them up the long way, one touching the other. Only the two outside frames have glass in them. Fasten the frames together with small cleats, putting a small screw through the end of each cleat. The screw penetrates the edge of only the outside frames, or those that are glassed; otherwise the inside frames could not be removed for the purposes of observation. Provide an entrance and put on a roof, and there you have the hive that Huber used. Sometimes, however, these frames were hinged at the back and then they could be opened at one side like the leaves of a book. Mr. Kellen says:

It will be seen that this leaf-hive was the forerunner of the Dzierzon frame. In fact, at first the frames turned outward, while the movable frames are inside. Such was the service rendered by this blind investigator, who in apicultural science, at least for his time, made true the little legend of his native city, *Post tenebras lux*—light after darkness.

In the above interesting account of Huber's work, it seems a little significant that two of his most valued helpers were women—his wife and Miss Jurine. Woman's place in the industries, inventions, and progress of the world, was beginning to be felt, even in the time of Huber; and oftentimes as I sit in the office and listen to the click of the type-writers (there are four of them now), and see how much of the brains and head-work of our establishment is in the hands of womankind, I deeply ponder. In a great many ways in these latter days, God seems to be choosing the weak ones of the world to confound the mighty.

HIVES.

CLOSED-END FRAMES, ETC.

THIS being the subject I have studied the most, my enthusiasm leads me to say a few words regarding Prof. Cook's article on pages 349 and 350. The professor asks if the advantage gained by the use of close-fitting frames doesn't cost too much. By this I apprehend he must mean to ask if we are not losing more than we gain by parting with the lateral movement of suspended frames. Now, I wish to say that all depends upon the construction of the closed frames. Mr. Langstroth said, and truly too, that the one main objection to all close-fitting frames of the past was the danger of pinching bees when they were put up together sidewise. Well, now, with my arrangement of the tight-fitting frames they are not put up together in that way, and do you not see that I can put a frame *down* into the hive and take it up much more rapidly, and not only that, but with no danger of pinching or mashing the bees, than we could when using the Langstroth frame? Heretofore the frames have been put together sidewise because they could not be shoved down, pushing them through all the way from top to bottom, removing the possibility of pinching a bee, because they were liable to slide sidewise; but with my arrangement there is no such thing as pinching a bee, either between the uprights on each side or between them and the case. However many bees may be there, they must be pushed out of the way. How is it when you lift a suspended

frame? You know that, unless nerve and time are expended, you are liable, by a little sidewise motion, to pinch bees—not mash them, but pinch them between the uprights of the frames and the case. You hardly notice any thing out of the way; and when you get a jab on the hand or nose by the pain-producing javelin of this bee, you hardly know why it comes. You can not imagine how much less stinging we have, and how much more amiable our bees seem to be, when handling them in the new hive, from whence we seldom move a frame, being able to accomplish all that the practical successful honey-producer could possibly ask without such removal. I mention the foregoing, because friend Cook really makes a mistake in classing my new hive with the Huber and other close-fitting frames. The shallowness of my frames, especially since the adoption of wired foundation, making good, straight, regular combs, the lateral movement of the frames is almost useless.

THE DOVETAILED HIVE.

On page 363 I notice what you say about the popularity of the Dovetailed hive; and so far as the dovetailing is concerned, or, more correctly speaking, the notching, if you make it as accurate and even as the box-factories, certainly your patrons will like it, all of which I studied on and talked about to my students several years ago when we came near putting in machinery for the purpose; but after all, friend Root, when I remember how many such practical bee-keepers as Prof. Cook, Hutchinson, and scores of others I might mention, feel in regard to my modification of the Langstroth hive as against the Simplicity, I feel very certain that it is the changing from the one to the other that gives your customers such satisfaction. I have made my modification of the Langstroth hive, with loose bottom-board with the cleats tacked on, the same as I use with my new hive, and sold them in that shape for about two years; and you will see that the Simplicity will be rapidly superseded by what I suppose I may call the Heddon-Langstroth. In a foot-note to a former article you call my attention to the fact that using cleats to make a bee-space on the bottom-board was prior to my invention of it. Certainly it was. I willingly admit that; but that arrangement is no part of my patent, except when used in combination with a divisible brood-chamber, etc. I think I can agree with the several customers you mention, in saying that you will undoubtedly find this the best and most practical hive you have ever sold, and I really wish I had one to look over as a sample. I am mainly interested in the quality of your workmanship all over the hive, and especially in the notching at the corners. I inclose order for a sample hive.

Dowagiac, Mich.

JAMES HEDDON.

Although I am favorable to the closed-end frames, I must say that I can not manipulate and examine in the same time as much comb surface in a divisible Heddon hive as in the old-style full-depth Langstroth. Perhaps it is because practice has not made perfect in my case. I have also tried, several times, shaking bees out of the brood-sections; but, my! how the bees did boil all over the bottom-board, in the grass, and — up my trousers legs! Perhaps I have not yet quite got hold of the knack of it. We shall take great pleasure in sending you a Dovetailed hive, Test the strength of the corner. ERNEST.

HOW TO DRIVE ANTS OUT OF BEEHIVES—MANUM'S METHOD.

HOW TO USE THE MANUM SWARM-CATCHER.

JUNE 1.—“Mr. Manum, what shall we work at to-day? We have got the sections all filled with foundation, the new hives nailed and painted, and I can't think of anything more to do here.”

“Well, Leslie, I have heard you and the other boys talking about going trout-fishing when you got the work done. It is now done, and I propose we all go to-day. While Fred and I are hunting up the fish-tackling, you boys may get the bait; and to-morrow we will work at the bees.”

JUNE 2.

“Here we are, Will. To-day we are to see that the queens are all laying well; and where we find any with only 10 or 11 combs we will give them more, as I think they are all strong enough now to cover the 12 combs. However, if you find any that are not, we will run them through the season with what they have, unless we give them a card of brood from a very strong colony that is liable to swarm before we come here again; also see that they have honey enough to last a week or ten days. Be sure not to forget that, because this is the trying time with the bees, it being the period between fruit and raspberry bloom. The bees are rearing so much brood now that they use up stores very fast, and the bees that will hatch in the next 20 days are just the bees we want to gather our surplus; hence it won't do to starve them now. We will now fill these carrying boxes with combs containing honey, and take them along with us to save steps.”

“Here, Mr. Manum, I wish you would look into this hive.”

“Oh! ants! and a lot of them too! Well, just wait a moment while I go to the honey-house. There, I will put some of this tarred paper in the hive, and by to-morrow every ant will be gone. This is the simplest remedy I ever tried. Now, as there are no more combs with honey in we shall have to put on sections partly filled with honey, left over from last fall, wherever they need feeding. It makes it pretty handy to have these partly filled sections on hand. We will just uncap the honey, and by the time we are here again the honey will all be below, and then the sections can be taken off.”

JUNE 6.

“Now, boys, I noticed yesterday that the raspberries were beginning to blossom, and I think it is time you should go to your respective yards. Fred will take two of you to your yards. Leslie will go to his by the railroad, and I will go with Scott to his yard. (Henry has a family, and lives near his yard.) Here we are, Scott. You will board with Mr. Smith while here.”

Scott says, “Mr. Manum, I wish you would lay out some work for me to do while I am waiting for swarming.”

“Work! you will find there is work enough before the season is over. In the first place you should examine every swarm, to if see any of them need anything. You may find some that have lost their queen, as there are a few three-year-old queens in this yard; and you know some of them are not full of comb; and where you find such, if they are pretty strong, and the queen laying well, you can spread the brood-nest and insert a comb in

the center. It will be safe to spread now at this season.”

“What shall I do if I find any that are queenless?”

“You will find that such colonies have queen-cells, and if the bees are pure and large, with long wings; and the stripes—or bands—instead of being light yellow are of a yellowish-brown, you may leave one to hatch; but if they are not pure Italians, or if the bands are of a bright yellow, or if the bees are small-bodied and short-winged, you may cut the cells out and give them eggs from one of those hives we have marked to breed from.

“Light-yellow bees may answer in the South, where the climate is more mild than here; but here in the North I find that the dark, or leather-colored bees, are preferable, hence I do not breed from very light-colored queens.

“Now, when you give such a colony a card of eggs for queen-cells you should cut holes in the comb the shape of an inverted Λ , or, more properly, an equilateral triangle, with the point upward.”

“Mr. Manum,” says Scott, “the books nearly all say that a long slit should be cut in the combs. Why is this triangle shape better?”

“Because it does not weaken the combs so much as a long slit does; and, besides, I think the bees prefer to build cells on a nearly perpendicular edge rather than on a horizontal one. Probably by the time these cells are old enough to transfer, you may need queen-cells in some other hive, or you can use them in your queen-rearing nuclei.

“After you have looked the bees over, the next thing to do will be to level up all the hives, as they are liable to get out of level during the winter. It is important that they be perfectly level; for unless they are, you will be bothered to get straight combs in the sections.

“When you have done that you will want to clean up the yard. Here is a rake, a hoe, a shovel, and a basket. I like to see a yard kept clean, during the working season at least. You can then mix some paint, and paint such hives as need it. Should there be a rainy day you can fasten foundation in the brood-frames. I don't like to fasten it in at home, as it is apt to break down when transporting it over our rough roads; and, besides, I want work for the boys to do rainy days, or you would get lonesome.”

“Well, Mr. Manum” says Scott, “you were right when you said I should have work enough to do. I think I shall not have time to get lonesome—ha, ha!”

“Now I must go. I shall call on you in three or four days; and after you have learned how to hive bees after my method, I shall come only once a week. I aim to visit each yard once a week, hence I have to visit two some days, as I have eight yards, and there are only seven days in one of our Vermont weeks. Now, if I should happen to be obliged to visit you on Sunday, please don't ever mention it so Mr. Root will hear of it, for he would surely give me a talking-to, and I know I could never stand his reprimand. Good-by.”

JUNE 15, AT CATON APIARY.

“Good-morning, Will! How are the bees doing here?”

“Pretty well for the last two days. Yesterday the scale-hive gained 6 lbs.”

“If that is the case, some of the hives must be ready for the boxes. Let us open some and see. Yes, this one ought to have boxes on at once. You

see, every comb is full of brood or pollen, and some honey; and, as you see, every cell from which a bee has hatched is full of new honey and bits of new comb built on the upper edges of the frames. This indicates that more room is needed. You may get a clamp of sections for this hive; also a sheet of enameled cloth to cover it with."

"One of your clamps, Mr. Manum, will not cover the brood-chamber; do you not want two clamps?"

"No, I put on only one clamp at first; and after four or five days, if the honey continues to come in, you may put on another."

"Do you like such small clamps as well as *whole* clamps that cover the whole hive?"

"Yes, for several reasons. First, they are much nicer to handle in the apiary and in the honey-house. In the next place, if I used large clamps holding 32 one-pound sections instead of clamps that hold only 16 sections, they would be larger than the bees ought to have at this time. It would be giving too much room at first; and, again, at the close of the honey season I find it very convenient to taper off with these small clamps. There, I place it on the further side of the hive from me; now cover the clamp with the enameled cloth, black side down, and lay the half honey-board under the hive where it will be out of the way until it is wanted after the honey season is over. There is a swarm coming out!"

"Where?"

"From No. 60; get me the swarm-catcher and I will show you how I do it. There, open the catcher-cage and hold it to the entrance and catch as many bees as you can and close it; lay it down and watch for the queen; as she is clipped she can't fly. There she is. Now I take her and put her in this little round pocket-cage that has a small wire hook to it, and hang this cage outside the catcher. It would be as well to put the queen right in the catcher; but in doing so some of the bees would escape; and, besides, by having the queen in this small cage she can be handled better than in the large catcher-cage. Now I see the swarm is circling over the north side of the yard. I take the catcher and set it up directly under the swarm, and leave them to themselves and go about putting on boxes as before, at the same time keeping an eye on the swarm. As I have explained to you how to hive the bees, it is not necessary that I repeat it, for I see you hived those six swarms yesterday all right. The next time I come I will show you about tiering up the clamps, preventing second swarms, contracting, etc.

"Now one word before I go. Be sure to keep a close lookout for swarms, because it is much easier to get the queen as she comes out of the hive than to hunt for her if she gets in the grass; and, besides, the sooner you get the catcher set up, the more likely you will be to catch the swarm and prevent their clustering in a tree or returning to the hive. Hence when you see a swarm coming out, *hurry* to it at once. Yes, *run* if you are a slow walker."

A. E. MANUM.

Bristol, Vermont.

There is one thing I don't like about the above. You let the boys all go trout-fishing, and then you did not take even one line to tell what luck you had, nor whether the trout were good, etc. Now, when I get my vacation to go up your way, I am going trout-fishing, and I am going to tell the

readers of GLEANINGS all about it. Probably a great many of them never saw a speckled trout at all, and more of them never tasted one. You folks away up in Vermont need not think you are going to monopolize *all* the good things.—Your plan of driving out ants is unique. Why, just think of it! Tear off a piece of tarred paper, and toss it into the hive. Mrs. S., down in the lunch-room, just told me that the ants were getting into the granulated sugar. I guess I'll "holler" to her to throw in a piece of tarred paper. The packers are using lots of it in the adjoining room. There is another reason for favoring clamps holding 16 sections instead of 32. A good many people would buy a clamp of 16 when they would not buy 32—that is, if you sell them in the clamp.—By all means, run when swarms are out. If you can not get up enthusiasm enough to run in swarming time, you will never succeed as a bee-keeper.

SETTING BEES OUT.

SHALL WE PUT THEM ON THEIR OLD STANDS,
OR SET THEM OUT AS CONVENIENCE DICTATES?

I CAN see that some of our best authorities differ on questions of vital importance to bee-keepers; and while this shows independence of thought, and perhaps, in some instances, a variation of circumstances which we do not take into consideration, yet there is one point which, so far as I can now see, there is a variation of opinion upon, which must be largely due to an expression of opinion without careful observation. The question is as to whether bees locate themselves afresh after being in winter quarters, or if, after months of confinement, they simply fly out; and if the hive has been on a new stand they return to the old location. I see no less an authority than "Langstroth on the Honey-Bee," revised by Dadant, considers it important to have them placed upon their old stands. Now, I have been taught to the contrary, and always preached to the contrary, but I could not say who was correct. Considering the question a somewhat important one, especially if a part only of the bees would be set out each day, I observed closely this spring. The bees were not placed upon their old stands when taken out, and they were set out partially one day and more later; half of them were moved to an entirely new yard, three-fourths of a mile away, and I can say with certainty that the bees did not fly out and return to the old stands, in those instances at least. Now, I claim there is enough to attend to that requires all our time and energies; therefore if there is nothing to be gained by observing and marking the place and hive of each colony, let us not do it. I would substitute the weighing of every colony at the close of the honey season; again when going into winter quarters; again when issuing from the winter repository, and again after the colony has had a cleansing flight. I believe an extensive test of this kind would give us information of value, and would prevent the loss of many colonies. My bees consumed an average of about 6 lbs. per colony in the front row, probably 11 lbs. in the back row, and the lowest consumption was 3 lbs.; the highest, I believe, 19 lbs., which

shows me the necessity of having not less than 20 lbs. of stores to go into winter quarters with.

A BOUNTIFUL HARVEST.

I have thought a good deal this winter of the prospect for 1889 for a honey harvest. You know the past two seasons have been none too good. The last year, in fact, as an occupation alone, meant starvation to many. Now, if the farmer had such a failure of crops, we should have prayed all over the land, asking God for a bountiful harvest. Now, I know you and many of us have faith in prayer; why, then, should we not "ask in faith, nothing wavering"? Of course, we know in this, as in all temporal matters, we should say, "God willing."

R. F. HOLTERMANN.

Brantford, Canada.

I believe I agree with you—or at least pretty nearly so. When bees are moved to an out-apiary—say for three or four weeks—they will certainly remember their old stand and make trouble if you don't put them back on their old stand when you get back; but after having been in the same place for *three or four months* I am of the opinion that there will not be enough going back to make it worth our while to be very precise about it.

The temperature now rose to 52°, never going below 51, and only once rising to 55, after long-continued warm weather, 70° outside, in the shade. I had feared that the cellar would be rather damp; but it did not prove so, and very few combs showed any mold. The bees were quiet all through the winter; and when removed, most of them Apr. 10, they were clean, dry, and slim-bodied, only two showing any signs of diarrhoea. All were alive, though two queenless colonies had to be united.

I have just examined all thoroughly; and in amount of brood and bees they compare very favorably with those wintered out of doors. The saving of honey was very marked. I am sorry that I did not weigh each and keep a record; but to the best of my belief and judgment there was an average saving of six pounds of honey per colony.

I make this report, not simply because it is a successful instance of cellar wintering, but to show that bees will live, keep quiet, and thrive, in a cellar much warmer than is usually considered proper. It may, too, give a hint on cellar construction to some.

Of 85 colonies wintered out of doors, all were alive, but two were queenless, and were accordingly united, which I think closes the list of my winter losses.

J. A. GREEN.

Dayton, Ill., Apr. 27, 1889.

MY BEE-CELLAR AND WINTERING REPORT.

SAVING STORES BY UNDERGROUND WINTERING.

PERHAPS it is getting a little late to talk about wintering, but I think a record of my experience last winter may be of interest to some.

Previous to last winter I had always wintered out of doors, except for a couple of small experiments with cellar wintering under unfavorable circumstances. But although I had never had any serious losses, and had usually had the best of success in outdoor wintering, I have long wanted to try wintering in the cellar, provided I could make a cellar I considered satisfactory. I did not want to be obliged to fuss with hard-coal fires, oil-stoves, sub-earth ventilators, etc., to keep the temperature up or down. I thought a cellar ought to take care of itself, and such a cellar I now have.

My apiary is situated just on the edge of a bluff about 70 feet high. At the bottom of this bluff is a vein of coal, scarcely thick enough to be profitably worked, yet mined to some extent. A year ago last winter I set two men at work to run a "drift" directly under my apiary. When completed as far as I cared to have it, it was a hole from three to four feet square, running 60 feet straight into the bluff, then at right angles to form a chamber. This was my wintering-cellar. Well drained, propped, and secured, it cost me nothing. Sixty feet away from the outside air in any direction, changes of temperature outside could scarcely affect it, hardly a ray of daylight could ever come, and no sound or shock ever came from the outside world, except the very faint rumble of a train passing near by on the bluff above.

Between Nov. 24 and Dec. 4 I put into this cellar 31 colonies of bees. Until Jan. 10 the mouth of the mine was left entirely open, the temperature inside ranging from 45 to 50°. I then put in a rough board door, having numerous cracks through and around it, but no other provision for ventilation.

Well, friend Green, you have a bee-cellar that is all right, I should think, if anybody has, unless, indeed, from 50 to 55 is too warm. Why not leave the openings unobstructed, so as to reduce it from 45 to 50? You say it cost you nothing. Surely running a drift 60 feet must have cost quite a little sum of money. I am curious about the matter, because I think I can get a spring for irrigating by running a tunnel horizontally into a side-hill; and I wish that somebody would tell me the cheapest way to do it. I suppose a 4 to 6 inch tile would answer just as well as a tunnel, if large enough for a man to crawl in. But how am I to run a tile, say 200 or 300 feet into the hillside? Some of the readers of GLEANINGS who are used to coal-mining can perhaps tell me how to do it cheapest. I very much prefer tile to a wooden tunnel. So far as I know, wood seems to be the only material used for running into a hill.

THE ALABAMA "BLACK BELT."

FRIEND CURTIS SUGGESTS EMPLOYMENT FOR OUR LEISURE HOURS.

FRIEND ROOT:—It is a long time since my name has appeared in GLEANINGS; but our work among the freedmen, in which I have been engaged for the last ten years, is too taxing on time and strength to allow much writing on outside subjects. I generally manage, however, to glance through GLEANINGS, especially "Our Homes;" and your California notes, and the Question-box, have intensely interested and greatly profited me.

The answers to Question 104, about the employment of our leisure hours, have particularly rejoiced me. Can any other secular profession show so many earnest Christian workers? The fact so

often exemplified in GLEANINGS, that very many of our most prominent and successful bee-keepers are deeply interested in all Christian work, encourages me to tell a little about our work of "spreading the knowledge of the truth as it is in Jesus." As brother Hasty says, it is *our* great business; and with us only leisure hours can be spent among our little golden workers, much as I love them.

For many years I have been deeply impressed with the terrible destitution of our country districts in the South—especially in the seventeen counties of what is called the "Black Belt of Alabama." This is a belt of rich agricultural lands, mostly black in color, containing magnificent bee pasturage, by the way, and running from southeast to northwest across the State into Mississippi. Here were the great slave-plantations before the war, and here the freedmen and their descendants have remained and increased until they outnumber the whites five to one. As the vast majority of the whites are in the cities and larger villages, the country population is almost wholly black. There are perhaps 30,000 colored people in the cities and villages of this Black Belt, where they have good schools and churches, and are improving rapidly; but at least 450,000 are on the plantations, where no missionary work is being done to any extent, and the public-school fund is so deplorably inadequate, and so poorly administered, that the statistics show that there are actually many more illiterates now than there were 20 years ago; i. e., the State has not nearly begun to educate the *increase*. The dense ignorance, superstition, immorality, and poverty of these thickly populated country districts can scarcely be imagined until seen. The country preachers, who wield great influence among these people, are in many instances worse than the people themselves. I have had five preachers at work for me at one time, who could not read a word of the Scriptures. They pretend to expound or write their names, and one has just been convicted of hog-stealing in an aggravated form. I have heard two preachers maintain in public that they were better preachers because they could not read a word, and therefore had to be taught by direct inspiration of the Holy Ghost. Another, a woman, claimed to be a great prophet. She had killed a woman by order of the Almighty, and raised her to life again, she said, and the people swallowed it all without a protest.

Some years ago, in our Selma ministers' meeting, the question of the evangelization of these country districts was raised. Brother Woodsmall, a Baptist missionary who had spent many years in the South, travelling extensively among the colored churches, said that it was his opinion, that, in the thickly settled cotton districts, the people were growing worse instead of better. A presiding elder of the A. M. E. Church (colored) followed in a similar strain with some terrible illustrations from his observation. I then proposed a plan for a self-supporting missionary and educational work, which, after much thought and prayer, and years of careful observation and experiment, is now being successfully carried out by the Industrial Missionary Association of Alabama. This is a stock company, organized under the laws of Alabama, with the purpose of buying plantations, renting them out to the colored people, and using the rents and income to supplement the public-school fund, and aid the people in supporting a more enlighten-

ed ministry. Many of these plantations can be bought at such low prices, on account of the rapidly increasing numerical preponderance of the colored people making it unpleasant for the whites to remain, that the rents will pay from 15 to 40 per cent on the purchase money, making quite an income for missionary work.

The negroes have been made and kept poor in very many instances, not so much by excessive rents, which are cheaper here than in the North, as by the excessive and often fraudulent "advances," which eat up the crop before it is made, and the ignorance and unskillful management of the tenant himself. Justice, fair dealing, advice, and instruction in improved methods of agriculture, and in household economies, together with improved schools and churches, will do wonders toward helping the colored man to help himself; and as soon as possible we mean to sell to each renter his homestead, invest the money in other plantations, and thus turn it over and over, and keep it working for the Lord and his people. This is not a new experiment. For four years we have been trying it, with very limited means, to be sure; yet we have two churches and schools under our auspices, and feel more than ever confident that this is the most efficient method and practical plan of reaching these, the most destitute regions in all our land. If we could command the means we could do more in this way to help solve the vexed "negro problem," which is attracting so much attention and discussion of late, than by any other plan that has been proposed. We have now decided to appeal to the public for help to extend our work, hence the incorporation of our association, in which we cordially invite all our friends and all who desire to see this "open sore" of our land healed, to take stock. Rev. J. W. Dill, of Selma, is the treasurer of the association, to whom all contributions and subscriptions for stock should be sent; and I shall be only too happy to give any further information, or answer any question, either through GLEANINGS or privately, as may be desired. It seems to me that we owe this people whom we enfranchised without educating, and who, on account of their ignorance, are in far greater danger and distress now, both from the white people and themselves, than if they had never had the right of citizenship, something more than an occasional thought or prayer. We owe them our *best help*, and what better way to help than this? I feel sure our bee-keeping fraternity will not be behind in this matter. C. B. CURTIS.

Selma, Ala., Feb. 8, 1889.

Why, old friend, you have gone and taken hold of and grappled with one of the greatest problems that stand before the people of the United States of America. One is reminded of David and his pebbles from the brook, when he went out to meet Goliath. Never mind, brother. The Lord God is with you, even if you are contending with fearful odds.

Since the above was written, Bro. Curtis has been with us, and we learn that he has been for ten years connected with the work of the American Missionary Association in the Southern States. Right here our stenographer suggests that, even if a great many of us do not know much about these things, the probability is that we shall *have* to know, whether we want to or not, very soon,

HOW TO RAISE BUCKWHEAT.

"IN THE MULTITUDE OF COUNSELORS THERE IS WISDOM."

IN answer to our call for articles on buckwheat culture, the following have been received up to date. In most localities I presume it will reach our readers in ample time to prepare the ground and get in a crop. As communications are constantly coming in, we shall have a continuation of the matter in our next issue.

BUCKWHEAT IN NEW JERSEY.

Buckwheat, like rye, is a grain which will yield a fair crop on poor ground, though of course a better one on good ground. Still, it is not advisable to manure it very highly, as it is very apt to "lodge." I doubt if the increased yield of grain would pay for the use of chemical fertilizers, while doubtless the lodging tendency would be increased. With us it is generally sown on rough, stony, or out-of-the-way fields, where a drill could not be used, and for this reason it is usually sown broadcast, using about three pecks of seed per acre. Buckwheat seems to do best on "new" ground—ground recently cleared of wood; and it is especially valuable in taming or subduing such land. Old meadows, and reclaimed lands generally, that are too "sour" to produce crops of corn are sown with buckwheat with this taming idea.

A favorite rotation for re-seeding, with grass, heavy clay lowlands, is buckwheat one year, oats the next, and grass without grain following oats, the same year. Buckwheat not being sown until the fore part of July, this allows ample time for getting heavy clay lowlands in shape for sowing. I say the fore part of July, but it is almost a superstition here to sow buckwheat "the Fourth of July, wet or dry."

I never heard of buckwheat making two crops in a single season here, but it is often sown early in spring, to be plowed under, and the land sown to buckwheat in July.

Much diversity of opinion exists about plowing buckwheat under, some claiming that it is a positive injury to the land. I think that trouble has arisen out of the practice, only when the buckwheat was plowed under while in full blossom. Avoid doing this, and you are all right. The ground should be well prepared for buckwheat. If it can be plowed some time before the grain is to be sown, at seeding time, the buckwheat sown on the plowed land, *cross-plowed* in and well harrowed, the chances for a good crop are enormously increased.

In harvesting, buckwheat is commonly cradled, before frost if possible, and preferably in the morning, while the dew is on, or on a damp day, as the grain shatters easily. As it is hard to dry the straw sufficiently for thrashing, it should be left in swaths for three or four days, then raked in bunches or gavels (again preferably while the dew is on), and set on end, unbound. It should be thrashed on a dry windy day, and should be cleaned from the chaff at once or it may heat. Even the grain, if in large quantities, may require shoveling over in the bins to prevent heating. In large amounts, or if slightly damp, thrashing by machine is the easiest way; if quite dry, it is easily thrashed by hand, two men thrashing it about as

fast as two horses can haul it to the barn; or if the barn-floor is reasonably large, the buckwheat may be spread thickly on it in a circle, and horses driven around over it. This latter method will give the cleanest grain and smallest proportion of cracked kernels. But use the machine every time unless the buckwheat is dry.

The straw is useless for litter, but it is the best thing obtainable for the bottom of the barn-yard, coming up from the ground so clean in the spring that very little scraping is necessary.

The new Japanese buckwheat, introduced here some three years ago, is growing rapidly in favor. It produces much more grain to the acre, and more and better flour to the bushel, than any of the old kinds. With no previous intimation, I detected the superior flavor of the Japanese flour the first morning we had cakes made from it. We had immediately before been using silverhull flour.

Bees gathered very little honey here from common buckwheat last season, but they worked freely on the Japanese.

R. A. LEARNED.

Newton, N. J., May, 1889.

BUCKWHEAT IN CANADA.

To prepare the ground for buckwheat, if stubble land, plow in the fall, then in spring stir the ground frequently, to make weed seeds germinate, and to destroy them in turn when started. If the field needs manure, and you have it to spare, put it on and plow, say about ten days before sowing the seed, and drag down again. This will cause an immense lot of noxious seeds to germinate; drag again to kill these and start more, and now the process of putting in the seed will kill these. If not underdrained, and if the soil is of a clay nature, open water-furrows, and roll; and I feel pretty sure you will feel happy every time you take a look at that buckwheat field. A crop of any kind of grain growing luxuriantly upon nice, clean, well-pulverized soil, can not fail to give pleasure, and make one think of God and his goodness. If a piece of sod be fixed upon, I would plow it about 12 to 14 days before sowing, and drag frequently. A roller should follow the seed. A drill covers the seed better than a drag can cover that sown by hand.

Some cut their buckwheat in the old way—with a cradle; others use a reaper. I really don't think there is much difference in the final results, if hands be plentiful and hiring has to be done all round. Buckwheat is now mostly thrashed with a machine; however, all counted, with from one to four acres it can be thrashed more economically, I think, with flail or with horses. When the crop is ready you can go right at it, and no waiting for a machine until it rains again.

To thrash with horses, you want two teams—one with a couple of smart boys to draw to the barn. Put on just enough for one flooring. The other team, with a couple of good men, will thrash it and shake the straw off while the boys get another load. If you put on the wagon more than one flooring at a load it will get damp from the sappy straw, and thrash very tough. Proper care should be taken to have the grain dry when grinding time comes.

Some object to this crop because of its persistency in growing the following summer in the succeeding crop. Well, I always got over that difficulty by sowing oats or planting corn on the stubble land. We never sow it early in the spring, like oth-

er grain. The hot summer sun would destroy the crop, very likely nineteen times out of twenty.

A HYBRID.

Some years ago I mixed some silverhull and common buckwheat, and sowed the two kinds together. The third year the grain was nicely blended, resembling both varieties, and I fancied yielded a better crop than either of the others.

BEEES AND BUCKWHEAT.

These thrive well together. With me the latter never failed to yield nectar, and always produced, I am fully persuaded, better crops because of the frequent visits of the bees.

DOES BUCKWHEAT PAY?

To the man who keeps many bees in a section of country where it is pretty sure to produce honey, I would say I certainly think it pays well, if properly handled all the way through—all depends upon that.

S. T. PETTIT.

Belmont, Ont., Can., May 1, 1889.

BUCKWHEAT IN KENTUCKY.

The ground for buckwheat should be thoroughly well prepared before the seed is ever sown, as, in fact, this is necessary for the successful growth of about any crop. Of course, the richer the ground, other things being equal, the greater will be the yield. Tolerably high bottom ground, second year's new ground, or any soil good for oats or wheat, will do for buckwheat. Ground that has been in clover, and followed with corn, is suitable, for the reason that the thorough cultivation required by corn keeps down the weeds and grass. It is not an easy matter to kill weeds after the buckwheat is up, hence the preparation of the ground the previous season is of much importance.

The ground should be broken early in the spring, before the weeds and grass begin to grow; then again when you wish to sow. It is somewhat owing to the locality and the purpose for which you are growing buckwheat as to the proper time for sowing. About the 20th of May or first of June I think is the average time, and three pecks of buckwheat is the amount usually sown on an acre. Just before sowing, the soil should be thoroughly pulverized, and leveled by harrowing.

The seed-bed should not only be deep but fine. In fact, the pulverization of the soil should be the main object; and the finer and more complete it is, the better the growth of the crop. Some practice drilling the seed and fertilizer together, but I believe the fertilizer should be applied broadcast, as it is more evenly distributed over the ground. If stable manure be used it should be well rotted, and thoroughly mingled with the soil, in order to give the field uniformity of growth. About 200 lbs. of guano to the acre should be sown, unless the ground is rich enough naturally.

When most of the seed is ripe it should be cut, and tied up in bundles. After it is thoroughly dry it should be hauled and piled or stacked in a tight-floored barn. It is also very necessary that the wagon-bed have a tight bottom, so that the shattered grain may be saved. I believe, where a person grows only a few bushels for his own use it is cheaper and easier to thrash it out with the flail. It would be much the best, when a person has much of the grain to clean, to get a separator to come to the barn and thrash it out. In this neighborhood the cost would not be over seven cents per bushel, even if the thrashing season were over.

I will only add, in conclusion, that I believe one of the best uses to which buckwheat can be put is that of feeding to hogs. By having different fields to mature at different times, we can turn our hogs into the fields from July till October.

Skilesville, Ky.

FINIS A. WOOTTON.

BUCKWHEAT IN KANSAS.

As you call for reports in regard to buckwheat, I will send you mine. Last year I raised 116 bushels—85 of Japanese and 31 of silverhull. I think the Japanese quite a bonanza. The beauty of it all is, that I was just 116 bushels ahead of nothing. As soon as my oats were off, my son plowed the stubble under. I sowed the seed broadcast. I also sowed one acre of my wheat stubble, after he had turned it under. On this I sowed 3 pecks, and secured 28 bushels of Japanese, and then lost at least 5 bushels of it in cutting.

HARVESTING BUCKWHEAT.

I cut mine with a mower. I had three hands—boys will do—to follow right after the machine, with four-tined forks. They gathered it in bunches, just as large as would dry through nicely. These bunches they lifted out of the way of the machine by the time it came around. I tried the self-rake, but I prefer the mowing-machine. The buckwheat should be cut while the dew is on. If necessary, cut all night, if you have much to cut. I hired a man to flail it out. To do this, make a platform up about two feet from the ground, of rails, and thrash it on that. I then put mine through the fanning-mill twice. Right here is the best part of the whole matter. That acre of wheat stubble on which I sowed buckwheat looks as well to-day as any of the rest of the 20 acres of wheat. The wheat is almost knee-high. When we were done sowing the other, I said to my son, "I am going to try an experiment." Ours is a Havana press-drill. The buckwheat stubble was so mellow that I just put the drill right in on the stubble. I now intend, as soon as the wheat is off, to have the wheat stubble of the whole 20 acres turned under and sown to Japanese buckwheat. But whether to sow the buckwheat with the drill or not, I should like to know, without experimenting very much. I had thought that, perhaps, if we would sow half that amount one way and then cross it with the other half of the seed, it might do. You know the old saying is, "Sow your buckwheat so that an old sheep and her lamb can lie down between the stalks;" but my idea in sowing wheat or oats is, if you want grain you must sow liberally. For buckwheat I sow about 3 pecks per acre. From our buckwheat we took off 300 lbs. of nice honey, and had all the nice buckwheat cakes and honey we wanted.

J. H. KENNEDY.

Quenemo, Osage Co., Kan., Apr. 25, 1889.

THE PROPER WAY TO RAISE BUCKWHEAT IN A DRY SEASON; HOW IT MAY BE USED TO GET RID OF THISTLES.

Having had 20 years' experience in raising buckwheat, I will give you a few pointers. First and most important of all, is to plow the ground *early*. Plow immediately after sowing oats or planting corn, or, in other words, one month before sowing. To kill "quack-grass," plow twice, and thoroughly harrow in with a spring-tooth harrow. Under no other conditions would I allow buckwheat ground to be plowed twice. You can kill thistles every time with buckwheat. Wait till the thistles are 15

or 20 inches high. You can then plow them entirely under by fastening a log-chain to the plow-beam and to the whiffletree of the horse that walks in the furrow. That way it will form a loop that will pull the tops in the furrow; and by having the loop just right it will cover every one. I have plowed them under when they were so large that the horses would not walk in the thistles without having leathers on their legs to prevent them from pricking them.

Buckwheat requires a great deal of moisture; and by plowing early the ground gets settled, and holds the moisture; and the result is, it will fill better.

Japanese buckwheat is 8 or 10 days later than the silverhull with me, so I sow a little earlier. On good land, 2 pecks is enough; on thin soil, 3 pecks per acre. You can increase the yield a third on thin soil by using 50 lbs. of phosphate and 50 lbs. of plaster, mixed and drilled in. I drill here between the 15th of June and the 1st of July.

Buckwheat is one of the best crops to subdue rough land. It always leaves the soil in excellent condition for potatoes or oats, or almost any crop except corn. I never could raise good corn after buckwheat—that is, until the ground was re-seeded. I raised 45 bushels of Japanese buckwheat from one bushel, sowing on $1\frac{1}{2}$ of an acre. Let me say right here, that the black bees will store just as much buckwheat honey as the Italians, and, in fact, I should prefer the black. I would rather have buckwheat honey to winter bees on than basswood honey. In 1887 I extracted 75 bbls. of buckwheat honey; 10 lbs. per colony is the lightest yield that I ever got from buckwheat, on an average.

W. L. COGGSHALL.

West Groton, N. Y., May, 1889.

ITEMS FROM ONE WHO HAS RAISED $8\frac{1}{2}$ TONS OF BUCKWHEAT FLOUR IN A SEASON.

I have been a farmer for 38 years, and sowed buckwheat every year, more or less, each year, from 5 acres to 30 acres in a season. I have not been able to quite come up to the thousand bushels, but have had enough to make $8\frac{1}{2}$ tons of flour of one year's crop, besides saving for our own use, and seed for next year.

The best way to prepare the ground for a good crop, according to my experience, is to plow, early in the season, good sod land; and, just before sowing, plow again. Drag and pulverize the soil well, and sow broadcast, and drag in the seed well. About three pecks of seed to the acre has given me best results in yields to the acre—from 25 to 40 bushels. I have sown as early as the 20th of June, and as late as July 17th. The largest yield has been from sowing from the first of July to the 8th. Location may have something to do as to time of sowing. As to risk of frost, we must be our own judge.

HARVESTING.

Cut when the grain is nearly all turned brown. When partly cured, rake and set up; twist a few straws around the top; that keeps it standing up better, if exposed to storms during time of curing out. When dry, so as to shell easily, we haul to the barn, and thrash with a machine. We have one standing in the barn, always ready for use. When thrashed we clean it up at leisure, mostly on stormy days.

The farmers in our county grow buckwheat quite extensively without fertilizers, and believe it to be an average paying crop to grow in rotation with

other crops. It always gives some honey, and sometimes large yields, and of good quality for the bees to winter on.

J. M. FRANCE.

Auburn Corners, Pa., April 29, 1889.

BUCKWHEAT AS A SUBDUER OF MARSH GRASS.

I have had considerable experience in the last few years in breaking up and subduing reclaimed swales, pond-holes, and marshes. I have found that buckwheat has done as much toward subduing the tough marsh grass as has the plow; and, in fact, there is nothing that can be sown which will yield a crop, and at the same time so effectually subdue such places as this grain. My plan is to plow these places, as well as possible, late in the fall, so as to let the winter's freezing and thawing operate upon the roots of the tough bog grass; and in the spring I harrow it down as soon as I can get upon it, and continue harrowing every two or three weeks until sowing time, which is about the 15th or 20th of June. The buckwheat should be sown earlier upon such places, for the frost is more apt to cut it than if sown upon higher ground. I sow about three pecks to the acre, in order that the ground may be well covered with the growing plant. Notwithstanding the plowing, harrowing, and cultivating, considerable of the marsh grass manages to be in a flourishing condition at the time of sowing; but the buckwheat so effectually covers the ground that the grass is killed, the weed choked, and the sod rotted nicely. In the fall, the once tough marsh sod is found to be light nice soil. If I can, I put the same piece into buckwheat the next season. Of course, when sown on such places it does not yield as much as when sown on better ground; but it pays well nevertheless. I prefer the Japanese to all other kinds.

F. N. HILTON.

Pontiac, Mich., May 4, 1889.

TWO CROPS OF BUCKWHEAT IN A SEASON.

As you may remember, I had quite a crop last season, of the Japanese variety. I also raised two crops last season from the same seed, which I forgot to mention. The first was sown some time in April. I remember it was chilled a little by two frosts after it came up, but it came on and filled well, and I gathered some of the seed as soon as ripe, and I sowed a small patch for a second crop, just enough for a test of raising two crops in one season from the same seed. It grew and ripened before the frosts of fall. The early part of the season was favorable for buckwheat. It might not do as well every year; if it would it would be of great advantage to know that fact. That early crop of buckwheat was quite a surprise to some old buckwheat-growers. I would sow with a drill. Drill in with chemical fertilizer, unless the soil is already very good. Load it on to a wagon, and haul to a thrasher in the neighborhood, if too small a crop to pay to employ a machine expressly for the purpose, and cut with reaper and binder, without tying.

H. R. BOARDMAN.

East Townsend, O., April 19, 1889.

BUCKWHEAT GROWING WHEN EVERY THING ELSE IS DESTROYED BY INSECTS.

To make a success in raising buckwheat requires moderately rich soil; if too rich it is apt to grow too rank, and lodge down. Fresh-plowed land, harrowed down fine and mellow, is needed. In this latitude we sow from the 10th to the 20th of June. Sow $1\frac{1}{2}$ bushels to the acre, on rich land, or $\frac{3}{4}$ bushel on sandy land. Cut with a cradle, self-rake, reaper, or

self-binder. Cut when the dew is on, or a little damp, as it shells less. Set it up, one bundle in a place, to cure. When thoroughly dry, haul direct to the machine, and thrash, as every time you handle it it will shell some. I have sown early, for the bees to work on, and one year we had cool weather when it was filling, and the yield was good. But early sowing is not advisable, as buckwheat will not fill well in hot sultry weather. There is a large quantity raised here every year, and it is considered a paying crop. We often get a crop of this grain, when the insects destroy all other kinds.

Eau Claire, Wis., April 19, 1889. C. B. JACKSON.

BUCKWHEAT A FAVORITE CROP FOR BRUSHY LAND.

I see in GLEANINGS you ask about buckwheat. I have lived in a buckwheat country all my life, and know something about it. It is a favorite crop for brushy land, the crop growing so rank as to subdue briars and brush. We sow from the first to the 12th of July; if earlier, the sun burns it; if later, the frost is apt to catch it. Ground which is too light for corn will raise good buckwheat. No crop will better respond to a good fertilizer. We gather tons of honey from it. It can be thrashed readily by hand if dry, but it is impossible if damp. We always thrash by machine.

JAPANESE BUCKWHEAT TO TAKE THE PLACE OF CORN.

The Japanese buckwheat I got from you beats any I ever saw. If it continues as well it will surely take the place of corn, to a great extent.

Meshoppen, Pa., Apr. 27, 1889. C. A. DEAN.

BUCKWHEAT IN THE "CORN-BELT;" BUCKWHEAT TO EXTERMINATE WEEDS.

In this latitude, or, rather, in this corn-belt, I think the best results are generally obtained by sowing about the first week in June. Land should be plowed a week or two beforehand, to give weeds a chance to start; then work thoroughly, and sow $\frac{1}{2}$ bushel, or a little more, per acre. I sow broadcast. Land which is so soddy as to be almost useless to plow in fall or early spring for other crops, can be subdued with buckwheat; and it is good to sow in a young orchard which is to be cultivated.

Speaking of corn-belts, one might be surprised at the crookedness of isothermal lines. A very good corn-belt map, showing mean temperature during the growing season, can be found in the seed catalogue of J. C. Vaughn, Chicago.

HARVESTING.

If you do not use a grain-cradle, it can be mown carefully with a scythe. If not convenient to draw it to a thrashing-machine, a good way is to build an open rack of slats across a wagon-box. Some put the box on a sled, so as to have it low down. Drive into the field, and pitch a few forkfuls of buckwheat on to the rack, and hit it a few sharp blows with the pitchfork. The grain will rattle down into the box, when the straw can be pushed off, and a new supply put on. Two men can do this rapidly, and I have heard of good-sized fields of buckwheat being thrashed in this way.

B. HASSETT.

Howard Center, Howard Co., Ia.

EARLY AND SELF SOWN BUCKWHEAT.

I have never sown buckwheat in April or May, but this I know: Buckwheat that comes up from last year's crop always fills well in this latitude. Only last week I was talking with James Malary (a successful farmer) upon this very point, and he

said he never knew self-sown buckwheat fail to fill well, and that last year (a very dry one) he had a patch that would have made quite a crop had it been left to mature. I also find that many are more successful in seeding with buckwheat than oats or wheat. As I expect to sow 20 acres of Japanese buckwheat this season, at different periods, from early to late, I may know more about it next fall than now.

GEO. E. HILTON.

Fremont, Mich.

The above articles cover the whole ground, pretty nearly. Friend Kennedy, if I understand him correctly, suggests a plan of getting a crop of buckwheat without any extra expense, except the cost of the seed, and drilling it in; that is, the ground is prepared for wheat in July instead of at the usual time. Then after the crop of buckwheat is removed, the wheat is drilled in, without any further preparation of the soil. While such a course might occasionally give us as good a crop of wheat as if no buckwheat had been on the ground, I can hardly think it possible that it would invariably turn out in this way. It is true, buckwheat may take little or nothing from the soil that would be wanted for the wheat crop. Unless, however, the season were one where rains were very plentiful, I should feel quite certain that the buckwheat would rob the ground of some of the moisture needed by the wheat; at least, my experience has been that a crop of almost any kind takes the moisture from the soil to a much greater extent than where the ground is harrowed frequently, without allowing it to bear any crop at all. I once plowed under a heavy turf of very hard stiff wild grass. After turning over the sod I raised a tolerable crop of buckwheat. Thinking the sod was rotted and the grass dead, after the buckwheat was taken off I turned it over again, to put on rye. To my great astonishment, the grass that had been turned over more than two months before, started to grow almost all over the field; and after letting it lie all winter, and turning it over again, I had a hard time in breaking the sod up in the spring. From this I judged that a crop of buckwheat might be taken from the ground without the roots going down more than a few inches, and also without taking very much if any thing from the fertility of the soil.

Some allusion has been made in the articles above, in regard to breaking the grain in thrashing; and several have stated that a machine breaks the grain much more than thrashing by hand. Where it is tramped out by horses on a barn floor, much of the grain will be crushed if you are not very careful. I strongly favor the idea of raising the grain up from the floor by rails, or something of the sort, letting the grain rattle down through where it will not suffer injury by walking over the floor. I am inclined to think, also, that flails will do better execution when the grain is raised up on rails.

I think it is quite true, that black bees take to buckwheat honey rather more than the Italians do. Our best colonies for gathering buckwheat honey for several different seasons seemed to be hybrids.

DR. MASON STANDS UP AND EXPLAINS.

CAREFUL STATISTICS ON THE AVERAGE CONSUMPTION OF STORES DURING WINTER.

WELL, friend Root, I don't understand why you should single me out, and "order me around" as you have on page 61, where you say, "Doctor, stand up and tell us what you mean by such a statement as that." And you are reminded "of the man who brought home two stoves," etc. I can't see the relation my statement has to "two stoves." Perhaps it was pretty cold weather when you were bossing me around, or my statement may have had a cooling effect upon you. At any rate, I don't see why I should be ordered to explain.

Prof. Cook reports the average consumption of stores by his bees at less than mine, and then, as usual, you come out ahead, for you say, "Come to think of it, I have done even better than that." Perhaps I have done better than you; but as you don't tell just how much "a very small amount" is, you have a chance to come out ahead yet. I too "have seen a weak colony consume only a very small amount of stores during winter," and not be profitable during the following season. I have also had a fair colony consume but 3¼ pounds in wintering, and be a right royal one the next season, making as good returns as any. I have also had a good colony consume 20 pounds in the cellar, and starve to death before it came time to set them out in the spring. I am not the only one who gives two weights as the average consumption of stores, and just notice the difference!

- H. R. Boardman, 25 to 30 lbs., indoors.
- Mrs. L. Harrison, 9 to 10 lbs., in cellar.
- " " " 18 to 20 lbs., outdoors.
- Dr. Miller, 20 lbs., in cellar; dead bees included.
- Geo. Grimm, 15 to 20 lbs., in cellar.
- C. F. Muth, 15 to 25 lbs., outdoors.
- Mr. Elwood, 12 to 14 lbs., in cellar.
- James A. Green, 18 lbs., outdoors.
- G. M. Doolittle, 14 lbs., outdoors; 10 lbs., in cellar.
- Prof. Cook, 7 lbs., in cellar; 14 lbs., outdoors.
- James Heddon, 20 lbs., outdoors; 10 lbs., indoors.
- A. B. Mason, 6 to 11 lbs., in cellar.

Muth, Green, Doolittle, Cook, and Heddon, outdoors? And Dr. Miller's colonies consumed as much or more in the cellar than did those of the others outdoors; for if Mr. Muth's figures were reduced to one number it would be 20 lbs., outdoors.

I believe Mr. Boardman knew just what he was saying when he said from 25 to 30 lbs., and I've been wondering if the others were not guessing.

Undoubtedly Mr. Boardman answered the question, from October to May. My answer was for the time the colonies were in the cellar, and I presume Prof. Cook's was also, as may have been some of the others. The question (102), asked in brief, is, "What is your average consumption of stores per colony from October to May? State whether for outdoor or cellar."

Messrs. Boardman, Green, and Muth, take less than a line to answer the question, and Messrs. L. C. Root, Dadant & Son, Grimm, and myself, take a line; Mr. Doolittle, a little over a line; Mrs. Harrison nearly two lines, and so on up; Mr. Heddon occupies eight lines. Now, friend Heddon, if this meets your vigilant eye, please just keep still, for I've got trouble enough on hand now, and don't want you to get after me; and if you will let me alone I'll give Rambler a blackboard exercise next spring on the "Pollen Theory" (if I feel like it). And, friend Root, if you won't let any one "pitch into me" after all this rambling, I'll tell you what I meant by my answer. It is this: Some winters the average consumption of stores by my colonies, while in the cellar, has been as low as 6 lbs., and sometimes as high as 11 lbs., and all the way between; but seldom over 9 lbs., and usually less than 8. Now, perhaps some "smart Elick" will want to know how I know what my colonies have done, and, just as likely as not, I may have so trodden on your toes, Mr. Editor, as to set you to asking me some foolish questions, and ordering me around some more, but I'll just take the snap out of you by answering, before any of you ask, by giving you a sample sheet of my book-keeping; and let me say it is no small job to keep such a record; but "it is lots of fun," and comes right handy when such questions are asked, and "Ramblers" are to be educated. Remember, friend Root, I am to be let alone. Here is the sample.

No. of Colony—1886.	Weight, Oct. 6, 7.	No. of Frames.	Weight of Frames.	Spaces of Bees.	Weight of Bees.	Weight of Stores.	Weight less Stores.	Fed Oct. 7, 8, 9.	Should weigh Oct. 10.	Do weigh.	Should be Stores.	Are Stores.	Lost in Feeding.	Weight Nov. 13.	Loss or Gain from Oct. 10 to Nov. 13.	Weight March 30, 1887.	Stores of Bees.	Loss or Gain of Bees.	Loss in Stores.	
133 4	6	7 2	2 9	3 14	34 6	5	48 14	6	11 13	(0-2) 12	13	43 8	9 2	-1	37-8	7 9	10	6	Hatching Brood.	
26 59 12	2	2 9	4	21	433 8	0	59 11	39 12	21	4 11 19	18	8	20	-1 4	Starved	4	20	Slight D., Some Brood.		
35 56	4	9 6	4	18	637 8	0	56	56	18-8	(18-8)	57	19-8	1	47	8 9	3-8	8-8	9-8	Hatching Brood.	
300		319	140-2	396	14	252			638-14				71-12							A space of bees weighs 7 ounces. A comb weighs 1lb. 3 oz. A division-board weighs 1 lb. 6 oz. A hive weighs 23 lbs.

Now, all the above names, except the last one, are among those of our most reliable bee-keepers. I can't imagine why you should question the truthfulness of my statement. Prof. Cook's average is less than mine. Why not ask him to "stand up" and explain? My average would be 8½ lbs.; and Mrs. Harrison, Mr. Doolittle, and Mr. Heddon give only 1½ lbs. more than I do, as their average.

If indoor wintering is such a saving, why not ask Mr. Boardman to "stand up" and explain how it comes that his colonies indoors consume more stores than do those of Mrs. Harrison, Messrs.

Average No. of frames per colony.....	7¼
Average No. of pounds of bees.....	3¾
Average No. of pounds of stores Oct. 10.....	9¼
Average No. of pounds of stores fed Oct. 7, 8, 9.....	6
Average No. of pounds of stores there should be Oct. 10.....	20¾
Average No. of pounds of stores there was Oct. 10.....	18¾
Average No. of pounds of stores Nov. 13.....	17
Average No. of pounds lost in feeding.....	1¾
Average No. of pounds lost from Oct. 10 to Nov. 13.....	1¾
Average No. of pounds of stores lost in wintering.....	8¾
Average loss of bees in wintering.....	2 oz.

I don't give this as a model way of keeping track of wintering, but as my way, and to show that I knew just what I was talking about when I gave my answer. There is one item more that I wish I had kept, and that is the gain in bees in each colony

while in winter quarters. One item I have not transferred from my record, and that is the "Pollen Theory," for I *may* want to put that on my black-board in the spring for "Rambler" to look at.

The record from which this is taken is of 42 colonies, and I have given some of the footings to show how I do it. The figures given are for pounds and ounces; as, in first left-hand column, to the right of colony No. 1 the 38-4 means 38 lbs. 4 oz. In the sixth column from the right can be seen -1, -1-4, -1-, which means that colony No. 1 lost, or was minus, 1 lb.; No. 26 lost, or was minus, 1 lb. and 4 oz.; and No. 35 gained, or was plus, 1 lb. In the second column from the right is shown that colony No. 1 had as many bees when taken out March 30 as when put in Nov. 13. Not but that there was a loss of bees from the hive in winter quarters, for there was, but there had been enough raised to supply the loss, for they were breeding nicely when set out. No. 26 was - (minus) 4 lbs. of bees and 20 lbs. of honey; had a slight touch of diarrhea, and brood dead in the cells before hatching. No. 35 was - (minus) 8 oz. of bees. My hives are the eight-frame Langstroth size, and 11 of them were put in winter quarters with 9 frames in each, and had bees in all the spaces.

Eleven had 8 frames in each, and bees in all the spaces.				
Seven had 7	"	"	"	"
Seven had 6	"	"	"	"
Four had 5	"	"	"	"
One had 4	"	"	"	"
One had 3	"	"	"	"

So you will see that they were not small colonies by any means.

Now, if your illustration of the two stoves saving all the wood will apply in wintering bees, so that, if one cellar saves half the feed, two will save it all, just send me another cellar, and send on your bees, and I'll winter them for you; and if you'll remove all the "bee bread" (sometimes called pollen) they sha'n't have diarrhea either. It seems the height of folly to winter outdoors when it takes, as you say, 30 to 40 lbs., and it takes from 6 to 15 lbs. to winter in a cellar or specially prepared repository. Look at our friend H. R. Boardman, whom you call "the man who winters his bees without loss," and justly too. He's got too much sense to winter his hundreds of colonies outdoors. And there is the Hon. R. L. Taylor, too, with his hundreds of colonies, who has too much of that same desirable commodity to practice outdoor wintering. And I might name scores of large and small bee-keepers who winter in the same way as do Messrs. Boardman and Taylor, and with equal success; and in this connection don't forget to include your humble servant.

I want to explain why I sometimes have so little stores in hives for wintering. It is enough to carry the bees through, and saves feeding sugar syrup, or good honey, and the honey I have on hand I don't like to risk to winter on; but as soon as set out in spring, the honey of poor quality can be fed in abundance.

Another thing: I believe it is pretty generally conceded, that an abundance of stores—that is, more than will in all probability be needed, conduces to breeding; and a goodly majority who have expressed themselves don't want their bees to commence rearing brood till set out of winter quarters. I have not been in the habit of putting bees in winter quarters before about Nov. 10, and have taken them out usually in March, or the first of April, so Messrs. J. Nebel & Son are right when, on page 127,

they say that I "may be correct also; likely not, from October to May."

I don't just exactly like your way of putting your question in your closing remarks on Question 102. You say, "Another question arises—Which is the more profitable—colonies that require from 20 to 25 lbs. to carry them through, or those that will get along on from 5 to 10 lbs.? Why not say, "Or those that require from 5 to 10 lbs.," etc., instead of "that will get along on 5 to 10 lbs.?" I have had some experience in this matter, and am satisfied, that, with me, it is not the amount of stores consumed that tells how profitable a colony will prove to be. Colony No. 22, whose record is in the table, a part of which is given above, was a good average colony, and consumed only 5 lbs. of stores, and was as good a colony as I had in 1887. No. 13 was equally strong, and had 5½ lbs. more in stores, and consumed 15 lbs. of stores, and was one of the poorest colonies I had the following season, and I could give plenty of such contrasts from the same table. J. Nebel & Son, above referred to, give about the same average I did, and add, "We think those numbers would be very near an average for ours. Only one colony consumed less than 6 lbs., and that one consumed only 3 lbs., and was a strong colony. Said colony did as well as any that season, 1886."

Now, friend Root, if there is any thing else you want me to "stand up" for, just "give me the wink" and I'll be on my feet as soon as possible.

Auburndale, Ohio.

A. B. MASON.

There, there, doctor, I will own up and apologize, and take back *every* thing I said. I supposed that you were going to leave me at least a little bit of a corner wherein to defend myself, and argue the point. Your array of figures, however, covering several years as they do, reminds me of the witness, who, when asked how far he stood from the fight, replied, "Just 14 feet 11 inches." There was a smile at his intense accuracy; and when asked how he came to be able to give the figures just to an inch, he replied that he expected that some blundering fool of a lawyer might ask that very question, therefore he took out his rule and measured it. To get right down to the real facts, we are exceedingly obliged to you; and I do not know but that we shall have to admit that there is certainly a great saving in stores by wintering in a repository, whether there is a saving of bees or not. It takes some pains and care to accomplish this saving in stores, it is true. Then the question arises, "How many of us are there who are willing to take this pains?" or, perhaps, "How many can succeed as well as you and friend Boardman do?" At present I prefer to have our bees on their summer stands—at least where they winter as safely as they have been doing for years past. Ernest may, however, conclude to adopt some other way. He seems to have managed nicely with one colony during this past winter, and it has been one of the mildest I have ever known. We are glad to know, too, that you have proved pretty conclusively that a good strong colony of bees may winter on a very small amount of stores—even so little as five pounds. Thank you, doctor; the "wink" will be forthcoming before a great many days, you may be pretty sure.

RATE OF FLIGHT OF BEES.

AN INTERESTING QUESTION.

PROF. COOK'S articles on entomology are very interesting to me. I believe he is doing a work for bee-keepers that no one else can do, and we owe him well-deserved gratitude. I see that in his article on the wings of insects, in GLEANINGS for April 1, he speaks of the rate of flight of bees, and says, "The bee flies often twenty miles an hour." I should like to have him dwell a little more upon this special point, as it has been a hobby of mine, and I have devoted considerable time during the last four seasons to experiments upon this very point. I have found the average rate of flight of bees to be twelve miles per hour, on trips of less than two miles: further than that, about ten miles per hour. Viewed from what data I have, I should say that the professor put the rate of flight too high. But perhaps he meant that bees often fly for short distances at that rate. I am well aware that the out-going bee flies swifter than the incoming, loaded bee, but as yet I have not been successful in finding the difference of speed. My experiments have been confined to flight from bait, and of course included the round trip.

WILLIAM E. GOULD.

Fremont, Mich., Apr. 5, 1889.

Your rate of speed must be very low, friend G. Prof. Cook's rate of flight, as recorded in his article, would seem to be rather an under-estimate than an over-statement, judging by the account of the experiment below. If Mr. Saunders' experiments were carefully conducted, then a bee *can* fly, under favorable conditions, 45 miles per hour—over twice Prof. Cook's rate, and four times yours. In experiments of this kind, the factor of wind, if blowing, and its direction with reference to the flight of the bees, should be taken into account. To make the experiment accurate, the air should be perfectly still. Will Mr. Saunders tell us the condition of the atmosphere at the time of his experiment? We presume, however, it was quiet, as it was toward evening.

ANOTHER RACE BETWEEN BEES AND CARRIER-PIGEONS; THE BEE DECLARED THE WINNER AGAIN.

In GLEANINGS for March 15 are a few remarks on bees vs. pigeons. I have some very fine carrier-pigeons; some of them have flown 400 miles in 12 hours, and many times have my birds been liberated in New York city, and reached Gloversville at noon, same day. In June of last year I sent to Johnstown, which is situated about four miles, air-line, or as a bird would fly, to Gloversville, six bees—four drones and two workers, and six of my best selected birds. They were all liberated at the same time, at five o'clock sharp, in the afternoon. The first bee arrived six minutes after five; first pigeon, ten seconds later; second bee, eight minutes past; after that, pigeons and bees came in so quickly one after the other that it was impossible to get correct time. The bees, on being liberated, took a perfectly straight course, as far as the eye could follow them; the pigeons circled in the air twice before they could see their home. This proves that bees fly more by instinct than sight, and pigeons by sight and observation.

I wish you would make GLEANINGS a weekly

journal. It is enjoyed much by us, and we are going to have it bound and put in our library.

A. C. SAUNDERS.

Gloversville, N. Y., Mar. 25, 1889.

The account of your experiment is extremely interesting; especially so as it substantiates the results of a similar experiment tried in Germany. From your experiment it is evident that a bee can keep up with the average passenger train, but it would seem not with the fastest-running train (i. e., at a speed of a mile a minute).—Thanks for your kind words; but if we were to make the journal a weekly, we could hardly illustrate or get it up in the style we now do.

In addition to what Ernest says, I wish to express my surprise that the bees got home at all, after having been carried four miles. In bee-hunting I have frequently carried bees with the bait so far from their home that they scattered, one in one direction and another in another, and seemed to be entirely lost as to the direction they should take, and we did not carry them four miles either. I should be glad to hear from others who have had experience in bee-hunting—any who may have made the experiment in carrying bees dusted with flour, or painted, some distance from their hives, in order to let them go back. Very likely friend S. had his bees so well marked there was no possibility of a mistake. If so, he succeeded better than I should have expected.

A BEE-HIVE ON SCALES.

HOW IT MAY BE OF BENEFIT TO THE BEE-KEEPER. TABLES OF HONEY YIELDS.

THE following excellent article from the pen of A. E. Manum, we take pleasure in copying from that spicy little journal the *Bee Hive*:

How many pounds of honey will a swarm of bees gather in one day? is a question that has often been asked. With your permission, Mr. Editor, I will endeavor to give the public my experience, through the columns of your practical little *Bee Hive*. For fifteen years I have kept a swarm of bees on scales in each of my apiaries, during the summer. Not only for the purpose of knowing how much honey a single colony can store in one day, but to assist in determining just what the bees are doing, from day to day, I deem it very essential that I should know just how much honey is being gathered each day, not so much for the pleasure of having a record to refer to in the future, but to serve as a guide by which to govern my operations during the honey-harvest.

Those who have never kept a hive on scales can not estimate the advantages to be derived by such a practice. We not only have a brief record to refer to in after years, but we are enabled to judge very correctly every day what the bees are doing, and also know, to a certainty, when the honey-flow begins, when it is at its height, and when it is drawing to a close. The amount of honey that a colony will gather in one day, I find to vary greatly in different localities. I find that apiaries located only three miles apart vary in the amount of honey stored in each. The condition of the weather has much to do with the amount of honey that will be gathered each day, as a few hours of unfavorable weather in the middle of the day will make quite a difference with our scale-hive record. Hence the apiarist must take the condition of the weather into account, and be governed accordingly in making his calculations. I have observed that, in a season when the atmosphere is well charged with electricity, and when electric shocks are frequent, honey

will be much more abundant than when electric shocks are less frequent.

When the lightnings flash and threaten our lives,
The bees will be sure to fill up their hives.

By the use of scales we are enabled to ascertain the value of the different plants from which come our surplus. I deem it very essential that we should know this, as I find there is a great variation in the amount of nectar secreted by honey-plants in different localities. For instance: Clover may yield abundantly near the home apiary, when three miles away, but little honey will be gathered from that source, although the bees in the out-apiary may appear to be working lively; when, by consulting the scales, we discover that but very little is being stored there, when if we had no scales to indicate to us the scarcity of honey in that vicinity, we should be at a loss to know why the sections are not being filled as fast at this out apiary as at home. It is but very little trouble to prepare a scale hive. Simply set the scales level both ways and place the hive on them, and prevent swarming if possible; and every morning, *early*, balance the scales and record the gain, or loss, for the past twenty-four hours. I use common cheap platform scales, that cost but \$3.50 each. It will be seen that there are many advantages to be derived by the use of scales in the apiary. I would not think of running an apiary without having a colony on scales; and if I had twenty apiaries, I would have twenty sets of scales, one set for each apiary. I give the records of two seasons, to show the difference in the length of time bees have to gather a surplus here in Vermont.

RECORD FOR 1875.

Date.	Lbs.	
June 17....	5¼	
18....	4	
19....	5	
20....	6	
21....	5½	
26....	5	Clover.
27....	13	
28....	8	
29....	9	
30....	9	
July 1....	12	
2....	8	
3....	9	
4....	4½	
5....	3	
6....	2	
7....	7	
8....	12	
9....	19½	
10....	18	
11....	20	
12....	20	
13....	20½	
14....	17	
15....	17	
16....	15	
17....	11	
18....	9	
19....	5	
20....	4	
21....	3	
22....	0	

Season closed.

It will be seen that in 1875 there were 31 days in which there was a surplus, while in 1885 there were but 18 days in which there was any gain, though in 1885 my surplus was all gathered in 12 days, the rest being stored in the brood-combs. A. E. MANUM.
Bristol, Vt.

There is one thing that surprises me in the above report, and I am still more surprised that neither yourself nor the editor of the *Bee Hive* seems to think it any thing remarkable. In 1875 your best yield in a single day was 20½ lbs. This is remarkable; but when we read that, ten years later, one colony made 33½ lbs., in a single day, we begin to think your bees must have gained skill and wisdom, as well as yourself, during the ten years past. May be I have forgotten, but I do not remember any such report of one hive in one day since the time of friend Hosmer. You must have a wonderful basswood pasturage in your vicinity. I

RECORD FOR 1885.

Date.	Lbs.	
June 15 ...	1	
16....	2	
20....	1	
22....	3	
28....	½	
29....	0	
July 10....	5	
11....	12	
12....	18	
13....	21	
14....	27	
15....	30	
16 ..	33½	
17....	30	
18....	31	
19....	28	
20 ..	18	
21....	8	
22..	½	

Season closed.

Clover.
—
Basswood.

think I might almost promise to make a trip to Vermont to sit down beside a hive of bees and see them "lug in" even 30 lbs. of honey between daylight and dark. Please tell us, will you not? something about your wonderful basswood pasturage. I once had a colony that made me a clean 10 lbs. on clover during one day, and that day was Sunday too, so I could watch them a great part of the time—at least I did in those days, years ago. In 1885, however, the best that clover could do was 3 lbs. We hope clover has improved with you since then. If using white poplar for sections in your vicinity has been the means of sparing the basswood, you have still another reason to thank God for white poplar. Your figures above teach us another lesson: If basswood is to be cut down, and no more be planted, at the rate it is now going it will be almost the ruin of bee culture. How much profit would you have had during the two years given above, without basswood? Is anybody planting basswood orchards but myself? Ours is big enough now so that Ernest is talking of locating an apiary right near the basswood orchard. He has bought a pony already, to ride back and forth—so much toward the enterprise.

DOUBLING IN TEN DAYS.

THE MERRY HUM OF SWARMING AND OF INCOMING LADEN BEES; THE BOY BEE-KEEPER, AGAIN.

WE had almost drifted out of the brotherhood since leaving the merry hum of a hundred colonies of golden Italians at the old homestead in romantic Georgia; but this season finds us again in the ring. In addition to our individual interests, a near neighbor with four colonies of good Italians insisted on turning the same, as they stood, into our hands. These bees were in single-story Langstroth hives, and stood on their winter stands, without having been so much as examined this spring, when we took charge, and one had swarmed and fled to the woods. Ten days thereafter we had increased, without the use of foundation, to eight colonies; and to-night, at the end of the thirteenth day, we have here nine full colonies and two two-frame nuclei with queens. We have taken about 25 pounds of comb honey, and some of the hives are literally packed with honey to overflowing, as was one of the original colonies when the tender comb fell down and two-thirds of the bees were drowned in the honey. In consequence of this disaster this colony has played little part in our increase. To begin with, we made an artificial swarm from one colony, giving three frames of brood and six empty frames on the old stand; in ten days they sent out a good swarm from a full hive, and retained a lively young queen. Of course, these bees had plenty of brood and workers to commence with; but they have "got there, Eh," at a lively rate, and it takes our best to keep them in the hives, as they have the swarming mania worse than any thing. The "Boy Bee-keeper" is again with the A B C class; but when it comes to a spring run and a big honey-flow, just pass us the cake. We think some of Bro. Root's colonies could score 100 pounds in any ten days this spring, if he'd just send 'em down here. CHARLIE R. MITCHEL.

Ocala, Fla., Mar. 30, 1889.

RAMBLE NO. 16.

THE RAMBLER TELLS SOME CURIOUS THINGS; USING A VIOLIN TO BRING DOWN SWARMS.

THE inauguration of a new president, and the retirement of President Cleveland, reminds the Rambler of a very pleasant visit with Mr. David Cleveland, of Pawlet, Vt., a distant relative of the ex-president. A large transferring job was to be done; the Rambler's aid was solicited, and in a day of lively work nearly 30 swarms were changed from old box hives to the regular Langstroth, and Bro. Cleveland was made happy. Mr. C.'s apiary is located among the splendid hills where a never-failing supply of honey is sure to be secreted. We found him to be a man on the shady side of 60, and a mason by trade. The usual hardships of life had given him a stooping form and a more aged appearance than he rightly should assume. We found that one of his crosses was a bed-ridden daughter, who seemed to be a counterpart of Anna Quillin. Miss Cleveland had not been from her bed for several years. Physicians said her disease was incurable; but the advocates of the Faith cure gave him hope again, and, behold, in due time she arose and walked the earth again. All hoped that she would become permanently strong; but, like the most of such cures (?) that have come to the Rambler's notice, it was not permanent; and after a few weeks of freedom she was again doomed to the narrow limits of a bed.

We here first learned of the existence of a "shut-in society," or a society of invalids who keep up a system of correspondence and exchanges. We were surprised to find specimens of rare plants from the tropics, and many things curious and instructive from remote parts of the country. We rejoiced with the invalid for that splendid institution, *Uncle Sam's mail-bags*.

Mr. C. gave us interesting facts in relation to other bee-keepers in his vicinity; and thinking a holiday among them would recreate him as well as interest the Rambler, later in the season we called upon Mr. C. It was at the twilight hour, and we found him mounting guard. A portion of his grounds are set out to grapevines. The boys from



NIGHT VIGIL AT THE GRAPEVINES.

a neighboring village are so immoral as to steal our friend's grapes. To protect them while ripening, for several nights he guards them with shot-gun in hand. His intentions, however, were not blood-thirsty, as he meant only to scare the intruder.

The next day we called upon several bee-keepers,

and among the most extensive was Mr. Cross Lincoln, of Rupert, Vt. The first thing we noticed about Mr. L. was his very pleasant appearance, giving a direct contradiction to those who have given him the name Cross. It beats all what misnomers people will tack on to a fellow sometimes. At the time of our visit, Mr. L. had nearly 200 colonies, and his honey-house was filled with as nice an exhibit of comb honey as the eye of a bee-keeper could look upon. Here for the first and only time in our life we saw 3000 lbs. of comb honey in half-pound sections, all crated and ready to ship to the Boston market. Mr. L. claimed that just as much honey could be obtained in these small sections as in larger ones, and that 2 cents per lb. more could be obtained for honey in this shape. They looked so fascinating that the Rambler wanted to get right home and prepare to run all of his colonies for half-pounds; but in correspondence with Mr. L. since, our ardor is dampened somewhat by his saying that he will return to the use of one-pound sections. Mr. L. combines potato-buying with bee-keeping. The potato-trade coming in the fall and spring, it does not interfere with the bee-business. His bees are wintered in a small cellar. The space is packed as full as it will hold, and the temperature must necessarily be very high. The only ventilation is a tube through the cellar window.

It seems to run in the Lincoln family to keep bees. An older brother, we believe Mr. Homer L., has the honor to belong to the fraternity, and his combination of other business is quite novel. Besides bees he gives his attention to fox-hunting and fiddling. During the winter months his violin is heard upon many a festive occasion, far and near. During the swarming season, when the bees are upon his mind, his violin, we are credibly informed, is used to a great extent. It is said, that with a violin you can strike a key-note that will vibrate down an iron bridge. It is also said that the walls of Jericho fell from this striking of a key-note between the rams' horns and the wall. So in this case, Mr. L. with his violin strikes the key-note of the swarm, and every bee drops to the ground. It is better, however, not to bring them all down at once. Some slow tune like "Old Dan Tucker," where the key-note is often struck, will cause them to alight in short order; and Mr. L. loses no swarms by absconding, so he says. The Rambler never saw Mr. L. do this wonderful feat; but if any violinist has doubts about it, let him try it next swarming time.



STRIKING THE KEY-NOTE OF A SWARM.

After a very pleasant day, which Mr. Cleveland also seemed to greatly enjoy, the Rambler set his face toward the spot where the sun went down; and after a few hours' drive he arrived at the Residence of Stephen Carpenter, the Quaker giant bee-keeper of Granville.

THE RAMBLER.

Friend R., please have plenty of charity for the advocates of the Faith cure. The inspiration and excitement attendant upon almost any thing which is novel, especially if it arouses the interest and enthusiasm of

the patient, is pretty sure to have a beneficial effect. If this interest and enthusiasm is also in a line with something good and praiseworthy, I think the chances are much better for success, and we should by no manner of means ignore the fact that a loving faith in the strong arm of the Almighty can never be a mistake. Mrs. Axtell's wonderful recovery was the result of faith in God, her love for the honey-bees, and a new ambition and enthusiasm that helped her as nothing else could, perhaps, to get out into the sunshine and open air. If Miss Cleveland has not had an account of this through GLEANINGS, we want you, friend R., to see that she does get it.—I have often heard that a violin would shake an iron bridge, but I never had an auricular demonstration of the phenomenon until I heard that roar in the Moniteau grand cavern I told you about.

THE ITCH AND FACE MITES.

PROF. COOK TELLS US SOME IMPORTANT FACTS ABOUT SOME "INTIMATE ACQUAINTANCES."

I AM requested by a subscriber to GLEANINGS to illustrate and describe these hateful pests. As these detestable miners practice no nice discrimination that causes them to leave bee-keepers out of question in their quest for forage, every bee-keeper is interested in their structure, natural history, and mode of life.

Mites belong to the spider—sub-class *Arachnoidea*—and so have eight legs, simple eyes, well-developed mouth-organs, but no antennæ. They belong to the mite and tick order, *Acarina*, and so are a mere sack with legs and mouth-organs appended (see figures). That is, unlike true spiders and scorpions, they have really only one part to the body—no distinct head or head-thorax. Mites are also peculiar in having six legs at first and eight when mature. All others of this sub-class have eight legs from first to last.

This mite order is a very extensive one, and the species included are very variable in their habits. Thus we have the cheese-mite and the sugar and flour mite, named from the substances which they infest. These mites are mere specks, though when very numerous they make these important food articles quite lively. As they are small—so small that they are usually overlooked, yet often the sharp-eyed housewife discovers them, and is very much disgusted; for howsoever pleased she may be to see her flour "rise," she is not pleased to see it walking off.

House-mites are black and red species—mere specks—which often gather on windows and under carpets in such prodigious numbers as to be incalculable. These are often seen, and I have received inquiries regarding them many times, and from many States. They are harmless, except for the discomfort arising from the presence of such vital specks in our homes. Many mites prey upon insects, which they destroy. Thus we are freed by mites from some of our worst insect-enemies. Other mites prey upon poultry, and do great mischief. Free use of an ointment made of kerosene and lard soon frees the poultry-house of these annoying pests.

The red spider is another kind of mite which

works in greenhouses, and, when the atmosphere is dry, on outdoor plants. Plenty of water sprayed upon affected plants quickly puts these vegetable-destroying mites to rout.

The phytoptus mites are a very minute, long, slim, four-legged species that also attack leaves of trees like maples, basswood, etc. These form teat-like galls on the top of the leaves, and were described and illustrated by me in GLEANINGS two or three years ago. So far as I have observed, they do no very serious harm. A silver-leaf maple in our old apiary was covered with these phytoptus galls for years, yet the tree continued vigorous and healthy, and made exceptionally rapid growth each year. Wood and cattle ticks are gigantic mites that often do serious harm, as horses are sometimes killed by their attacks. I will illustrate and describe these jumbo mites at some future time.

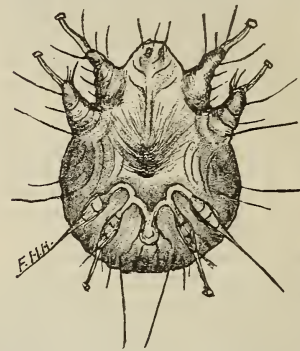


FIG. 1. ITCH-MITE GREATLY MAGNIFIED; VENTRAL VIEW.

which gives rise to the name "itch," applied to the disease caused by these microscopic mites. The old name, seven-year itch, shows how hard it was in old times to exterminate this enemy. Nor do I need to say old times, for within a short time a young man came into my laboratory with very suspicious-looking hands. He was a nice, neat young man too. I said, "What ails your hands?" He replied, "I wish you could tell me. I have had this trouble for four years"—more than one-half of seven—"and have consulted two or three physicians. Not one can tell the trouble or help me." I took a scalpel, picked away a moment at one of the pustules, placed my "find" under the microscope, and showed him a plump itch-mite. He was ready to dance with joy when I told him that a little mercurial ointment, or an ointment made of lard and kerosene, would at once rid him of this plague. Isn't it a sorry compliment to our physicians that they can not rightly diagnose and cure this itch-plague? Or, rather, is it a compliment, perhaps, to our civilization, that itch is so scarce that our "M. D.'s" have no chance to study the malady, and little occasion to examine and treat it?

The face, or pimple mite, *Demodex follicularum* (Fig. 2) is a long slim mite that bores into the skin, causing pimples. This mite is even smaller than the itch mite, $\frac{1}{50}$ of an inch long, and burrows in the hair-glands. It finds a favorite lurking-place and feeding-ground along the nose. It has been said, that one person in every ten has

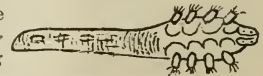


FIG. 2. PIMPLE OR FACE MITE GREATLY MAGNIFIED; UNDER SIDE.

bors these pimple mites. They are hard to exterminate, but, fortunately, they do little harm except to mar the fair face of beauty. Possibly in humbling pride they may be a disguised blessing, proving Shakespeare's paradox: "Sweet are the uses of adversity."

These two mites, if we except the old wood-ticks, are all that attack man. In another article I will describe the Texas cattle or pony tick, and then speak more fully of the old wood-tick which formerly, before the forests were cleared away, were far more numerous than now. A. J. COOK.

Agricultural College, Mich.

Well, I declare, friend Cook, entomology did do good service for once, didn't it? I wish I could have seen your face when you demonstrated by science the problem the doctors could not grapple. Now, I tell you I believe in that sort of medical education. When we learn to chase out disease as we would chase out rats and mice, we are at work with a solid rock under our feet. I am a little surprised to know that live animals really burrow in the skin of the face. I have heard this contradicted so ably that I had decided it was only a piece of superstition. I trust they are not very common. How about pyrethrum for these minute animals? If one had the itch, would not pyrethrum, rubbed thoroughly into the skin, have the effect it does on all other kinds of insects? I have heard my father tell about wood-ticks when he used to work in the clearing around our log house in the wilderness, and therefore I am much interested.

SUPERSEDING DRONES, AND DRONE COMB.

DR. C. C. MILLER TELLS US SOMETHING OF SOME SENSIBLE METHODS OF DOING IT.

IF there is no interference on the part of the bee-keeper, an unprofitable number of drones will be raised. It is supposed by some, that, for the best success, each colony should be allowed to raise some drones. I never saw any reason given for this, and I suspect there is no kind of need for any drones, except as many as a single colony will raise, even in a good-sized apiary. Perhaps if the matter could be fully controlled, the best way would be to have not a single drone raised, except in one colony, and that the best in the apiary, and to raise no queens from that colony. But with all the pains that may be taken, there are likely to be drones raised in nearly every colony. Even if you fill a hive with worker foundation, the bees will build some drone-cells. Not many, however, but from year to year the amount of drone comb is likely to increase on account of the bees filling up with drone comb any hole made by mice or in any other way. It will pay to look this matter up annually, and make the effort to prevent drone comb in all but the one colony.

A good time for this is in the spring, when the combs contain the least honey. If you find holes in the combs you may be pretty sure that, if left to their own sweet will, the bees will fill it with drone comb. To prevent this, fill it yourself with worker comb or worker foundation. Take one of the combs that has in it a good deal of drone comb, and cut it out of the frame to patch other combs with. Then cut the drone comb out of another frame; lay this

frame over the comb to be used for patching; mark with your knife the shape of the hole on the under comb, then cut out the piece and crowd it in the hole and the bees will do the rest. If the frames are wired it may be better to use foundation. Cut away the cells around one side of the hole, so that the septum shall be bared about the margin for perhaps a fourth of an inch, and press on this a patch of foundation, preferably somewhat warm. Let me remind you, that, if left alone, the combs will gradually have a larger and larger percentage of drone comb, and that it is not likely any hole will ever be filled by the bees with worker comb, and that every square inch of drone brood not only takes the place of a larger amount of honey, but that these drones, when hatched out, make heavy drafts on the stores brought in by the workers. I think Cheshire has estimated that each drone raised means the loss of about three times its weight of honey; but I may be wrong about this.

While you are at it, let me call your attention to another thing to notice, as you look over the combs. I do not remember to have ever seen it mentioned, and it is quite possible some of the veterans may be glad to have their attention called to it. When extracting our honey, if the emptied comb is examined there will very often be found cells a quarter, an eighth, or even a sixteenth of an inch deep—possibly a patch of several square inches of such cells. They have been made in this way: In moving the combs they have been so placed that two sealed surfaces have been placed together, but so far apart that, when the bees have been increasing their store room, they have built cells on top of the capping; and when the comb was taken from the extractor, the honey still remained under the lower surface of the capping. So far you have noticed this. Now, did you ever notice that the bees never uncap this lower capping? Even if rudimentary cells have been begun on top of the capping, in which not a drop of honey has ever been put, nor could be put—so shallow, indeed, that ordinarily it would hardly be noticed—all the honey that is under the capping in such a place might just as well be so much lead so far as the bees are concerned. I put a comb containing such honey, last fall, out in the open air, at a time when the bees were inclined to rob. Not a drop of honey was taken from it. If, in the course of time, as much as a quarter of a pound of honey should thus accumulate in each comb, it would be a matter of some moment. So whenever you see these shallow cells, punch a hole in the bottom, which was originally the capping, and the bees will tear out this false bottom. If the surface of such cells is considerable, cut away and uncap it. C. C. MILLER.

Marengo, Ill.

Friend M., I have done exactly all you mention, and have observed all you speak of, and I believe that my conclusions were just about the same as yours. I never saw very much honey left in the comb, however, because of this intermediate capping, and the robbers in our vicinity would certainly have found it in time. I have known them to chew up a comb and pack it on their legs and carry that off too. The chaps that carried off the comb, however, might not have been positive robbers. I have seen colonies get along apparently well, even after I had removed every cell of drone comb; and it

certainly makes a very great difference in the yield of honey, this getting rid of drones entirely, when none are wanted.

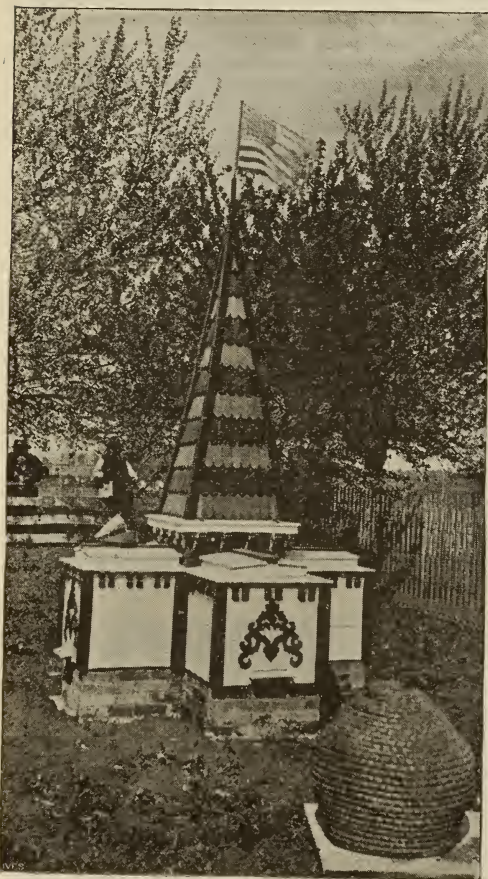
ORNAMENTAL HIVES.

LEVI STOVER'S TENEMENT HIVE, AND HOW IT LOOKS AFTER COMPLETION.

SINCE the publication of the sketch of the tenement hive, March 1, 1887, I was frequently reminded that other bee-keepers were interested in ornamental hives, as I received letters from different parts of the country, asking for further description. For the benefit of other bee-keepers who have time or taste for the ornamental part of bee-keeping, I send you a photograph of the hive. There are four colonies of bees in it, doing well, but not any better than in single hives. The spire is fastened with hinges, and is used to store chaff cushions in the summer. For a contrast, the straw skep was placed in the foreground while taking the picture. It was made by my father, 64 years ago, when 19 years old. He is still living, and also keeping bees. He has had from two to twenty colonies since his boyhood, but his bees are still governed by a "king."

Brookville, O., April 25, 1889.

LEVI STOVER.



SIXTY YEARS AGO AND NOW, SIDE BY SIDE.

CELLAR WINTERING.

FRIEND DOOLITTLE THINKS DAMPNESS AND CLAY SOILS NOT NECESSARILY DELETERIOUS.

IF this article is a little out of season, I hope the readers of GLEANINGS will excuse, for I feared that, if I did not give it now while it is fresh in my mind, it would never see light at all. I see, on page 296, that Prof. Cook thinks that a bee-cellar in sandy soil is better to winter bees in than one in clay soil, and that you, Mr. Editor, agree in the same thought. Well, this may be so; but I wish to say that no one need be debarred from wintering his bees perfectly in a cellar, even if the soil is the worst kind of a clay. The soil where my bee-cellar is situated is of a mixture of clay and what we call "hard-pan," the same holding water even more tenaciously than all clay, if possible, yet my bees have all come out in the very best condition possible. There has been so much moisture in the cellar the past winter that it has stood in drops all over the roof on the inside nearly all the time; while on the door, which is painted, it has run down so as to stand in puddles at the bottom. Besides this, mold has formed about the sides, so that some handsome specimens have reached the length of two inches in the center, while the base of some of the largest patches is six or more inches in diameter. Now, I feel almost like asserting that dryness or dampness, ventilation or no ventilation (except that which will pass through the surrounding surface), has nothing to do with the bees wintering well, but that the whole thing rests on the right temperature. I can not see how the professor's cellar should be so cold unless he has a room above it.

Nov. 5th I commenced to place my bees in the cellar, putting in a few each day till the 11th, when all were in. A week after this, the temperature in the cellar stood at 45°. It very gradually lowered, till, on the middle of January, it stood at 42½°. Here it stood till about the middle of March, when it gradually rose, so that, on the 10th of April, it stood at 45° again. On the 15th of April I commenced to put the bees out, putting a few out each day when the weather outside was right, till the 24th, when all but eight were out. It now came on rainy and cool, so that, as I write, the eight are still in the cellar. Although we have had the mercury as high as 82° in the shade during this month, and I have had the doors open to a certain extent while carrying the bees out, still the thermometer has not been above 45° in the cellar after the same had been closed an hour after setting bees out. I have just been to the cellar, and find all just as I have described above, with the bees in the eight hives still remaining as quiet as they were last December, and occupying from five to eight ranges between the combs. In one colony, nearly a pint of bees hang below the combs; and after watching them quite a while I failed to see one of them stir a single bit till I breathed on them, when they readily told me that they were all alive. As these colonies that are still in the cellar are those that were set in first, it will be seen that, when five more days pass by, it will be just six months since they saw the light of day; and yet if damp and moisture are detrimental to bees wintering, and if they can not winter without special ventilation, they should have been dead long ago. An examination of those set out of the cellar shows that

they have not consumed half of their stores, and also that scarcely a bit of brood has been reared, although all colonies have a few eggs when first brought out. One or two had some hatching brood, but so far I have found no larva in a single hive. Some of the colonies first set out now have brood in all stages possible for the length of time they have been out, being fully up to the best colonies wintered outdoors along this line; and I suspect that those that are in the cellar would have been better off had they been set out when the first were, yet I can tell better about this when the basswood comes to blossom.

While Prof. Cook reports that he has had to keep an oil-stove in his cellar to keep it warm enough, I see many reports where the unusually mild winter has caused bees in cellars to become uneasy and winter poorly, besides making the owner a "thousand sight" of work opening windows and doors nights to keep the temperature down. The professor speaks of my loss when using an oil-stove as if he does not know how to account for it. Well, the difference was, that, while he maintained the temperature in his cellar at 40° as near as might be, I kept mine that season at 50° and above. Some have claimed that the oil-stove caused the trouble with me, but I have always claimed that it was the high temperature.

I now wish to say a word or two in regard to hibernation. As all will see by what I have written above, my bees that were in the cellar "hibernated" the past winter, if bees ever do such a thing, and that they are at it yet as much as they have been at any time, in the case of the eight colonies now in the cellar.

Well, some of the hives placed in the cellar were chaff hives, and in one or two of these hives those large black ants, which have been seen by nearly all in old partially decayed trees had made a home during the past season. One of the hives infested with these ants chanced to go into the cellar, from which I had taken the sawdust cushion, and I looked at the bees at least half a dozen times during the winter, I not knowing that there were any ants in the hive, or, rather, in the chaff packing. On the 18th of April I noticed that these ants were out around the hives that were outdoors, which were the first I had seen for the season. On the evening of the 20th I went into the cellar to fix for carrying more bees out the next day, and I heard a continual "zeep, zeep," from the bees in a certain part of the cellar, which was something I had never heard before in that place. By listening I soon found the hive it came from, and upon raising the sawdust cushion I saw twenty or more of those large ants, with their heads under the quilt over the bees, trying to catch hold of the bees which were uttering these notes, and trying to drive the ants away. Now, the question is, as the temperature of the cellar had not changed in the least for several days previous, and but very little during the whole winter, how did these ants know when to wake up at the same time those did which were outdoors, and why were the bees in all of the other hives as quiet as they ever were, being so still in the eight hives which remain? All know that I do not believe that bees hibernate, while I know that this species of ants do; yet it would seem that the temperature has little to do with the hibernation of these insects, while it has all to do with the quietude of the bees. Who can tell us more about this

strange suspension of life, and the power of taking it up again at will?

G. M. DOOLITTLE.

Borodino, N. Y., Apr. 30, 1889.

In regard to the ants, friend D., I have seen them frequently in their dormant state; but they always came out of it when the temperature was raised sufficiently. I do not know whether disturbing ever roused them up without lowering the temperature or not. Perhaps Prof. Cook can tell us. Now, bees at a certain temperature, where they have rest and quiet, assume a state apparently much like that of the ants; but they are roused by a jar, or even by breathing on them, as you mention, and that, too, without any change in the temperature. Another thing, the ants, while in their dormant state, consume no food at all—at least I suppose they do not, and I presume they may remain in that dormant state for six months—may be longer. So far as I know, bees consume food—at least it is my impression they go to the stores and fill up once in, say, three or four days. To tell the truth, however, I do not know very much about it positively. Who does? When a bee is once filled with honey, how long can it live if the temperature remains favorable?

MRS. HARRISON'S LETTER.

BEE CULTURE IN DENMARK.

FOR a fortnight past I have been visiting some nephews and nieces, lately bereft, in the village of Granville, Ill. While there I visited Peter Dahl, a Danish bee-keeper, born on the island of Bornholm, in the Baltic Sea. This island is about thirty miles long, and from sixteen to eighteen miles wide. It furnished us a number of hardy soldiers during the rebellion, among them the subject of this sketch. In answer to my inquiries, with reference to bee-keeping on his native heath, he said there were no bees kept in towns and villages when he lived there, but all the farmers had some, with very few exceptions—hardly any but that had bees. The house, stable, and out-buildings were all built around a square, and this yard was paved with stones. These farm-buildings were so constructed, being built of stone and long rye straw, pounded down and covered with pitch, as to last for hundreds of years. On each side of the door that opened into this paved yard were two benches for bee-hives, right under the windows. There was a stone fence built around these benches. When the bees swarmed they were put into a straw skep and placed upon the bench. Then they were plastered around the bottom with mortar made of clay, leaving only a very small entrance for the bees. This was done to keep out a beetle with two pincers, and had a tail. Mr. Dahl has never seen any in this country, and does not know what harm these creatures did to the bees or honey; but the plastering was done to keep them out. In the fall the hives were all lifted, and the very heavy and light ones taken up, while the medium ones were preserved for another year; never more than four were kept over. There was no arrangement for securing surplus, and no comb honey was used. The honey was pressed out; and if any was sold it was by quart measure.

Bees gathered honey from the bloom of apples

and pears, which did well there; from white and red clover, flax, mustard, and heather. There was a sandy tract in the center of the island, which belonged to the king, and here is where the heather grew, and every family was allowed one load of it to kindle fires.

Mr. Dahl showed me a bee-book in the Danish language, but all I could interpret was occasionally the name of Dzierzon. He says he knows one person on the island who now uses frame hives.

Peoria, Ill.

MRS. L. HARRISON.

MRS. HILTON'S LETTER.

CALIFORNIA, AND SOME THINGS IN GLEANINGS.

I FELT sure that you would not feel satisfied with the short visit that you made to our beautiful land, so I was not surprised to read that you were coming again. You would have enjoyed a visit with Uncle James Gilchrist, at Montecito. I know I did when we were at his place, and may be we then can have the pleasure of seeing you and your wife. I did not expect you on this last trip, for I felt that you would have to be more than mortal to see half you ought to in the short time you allowed yourself. Don't leave Huber behind when you come. When Mr. H. read that piece where you quote "Beulah Land," I had to smile, for that is what I sing when upon a mountain. It is so appropriate, I find myself singing it before I think. I do not see how that man killed those tarantulas with chloroform, for I tried my best one time to dispose of one so as to have a fine dead specimen. I put a tumbler over it, wet a large piece of cloth with good chloroform, and shoved it under the tumbler with a knife, and left it all night. The next morning Mr. T. was as lively as ever. Then I wet the cloth three or four times during the day, but it would not give up, so I had to kill it another way.

Did you ever have your credit too good? Ours is, or was this spring, any way. We wrote to a dealer in San Francisco to know if there were any sweet potatoes in market, and at what price, as we wanted 100 lbs. for seed. In a week our station agent informed us that there was a sack of sweets at the depot, waiting for us. Now, we had been sold once before on sweet potatoes by having them shipped in a sack, after paying a fancy price for them, and we did not have any hot-bed ready for them; so imagine our feelings. Of course, they were badly bruised and rotting; so if we get 100 plants under the circumstances, we shall think we are lucky. The dealer thought he was doing us a favor to send them immediately, and we shall not let him know any thing to the contrary. But what I want to make out after this long preamble is, don't ship sweet potatoes in any thing that they will get bruised in, or customers will pay dear for their seed. We enjoy the agricultural department of GLEANINGS very much, also Rambler's letters, and—but, what is the use of specifying, for we read the whole thing from beginning to end, and think each one better than the other? Of course, you know by the large list of subscribers that you furnish a good article; but may be you are like our minister. I thanked him for the excellent sermon he gave us last Sunday. He looked at me in surpris a moment, and then said, after drawing a long breath, "Did you like it? Well, I am like one of our bishops. He said he had to have a word of praise once

in a while, to keep going." I had to laugh a little, as it is hardly decorous to clap our hands in the Lord's house when the minister gives a good thought. I have always felt that we should give a word of praise after the sermon. But I, as well as others, am something like the little girl that was chided by her mamma for not saying "thank you" for something she had received. She said, "I did say thank you." "Why, no, my child; I did not hear you." "Well, I said it, any way, down in my heart."

MRS. J. HILTON.

Los Alamos, Cal., April 11, 1889.

Yes, Mrs. H., we have had considerable of such experience as you mention, with the sweet potatoes. Where a dealer is overstocked, and very anxious to get rid of his stuff, he sometimes ships it to parties who simply make inquiries. He should, however, always state that the goods are sent on approval, and if, in so doing, any thing is not perfectly satisfactory, he will make it so. I think you should have told him just the state of affairs, and let him bear at least a part of the loss. We have sometimes sent goods in that way, when customers mentioned that they were greatly in need of them; but where goods are sent without a positive order it very often makes trouble.—I think your minister is exactly right in the point he makes. It is words of encouragement that stimulate us to try still harder in speaking or writing; and without that, I doubt if anybody could do his best. When the work is in the line of bringing souls to Christ, kind words act like inspiration. I am glad you like "Beulah Land."

HEADS OF GRAIN

FROM DIFFERENT FIELDS.

HUMBUGS AND SWINDLES.

THE Golden bee-hive man took in this county last winter, and sold the right to two gentlemen for \$100, who, hearing I was interested in bees, came to see me. It was a terrible old box. I told them I should like to have some to set hens in. They had a lot of circulars and testimonials, among others one from Prof. A. J. Cook, saying he had taken, if I remember right, 200 lbs. of honey from a Golden hive, which I told him I did not believe. Of course, I did not blame these gentlemen. They were persuaded to buy the right, and knew nothing of bee culture or bee-hives. I think they told me they had never seen a bee-journal. I gave them the names of several. The man who duped them was a Tennessean. I have forgotten his name. A. R. KILLINGSWORTH.

Red Lick, Miss., April 16, 1889.

Friend K., if you will look in GLEANINGS for Sept. 15, 1888, p. 693, you will find that we published an extract from the circular you mention; and at a later date, see page 767, Oct. 1, 1888, you will notice Prof. Cook's statement that he never used the Golden hive, and never wrote any such statement. It is a point-blank forgery, and the men who go around distributing such circulars should be arrested. I hope you will show them the numbers of GLEANINGS that I have referred to, as well as this one.

We will send them wherever you direct, free of charge.

C. C. MILLER DISCOURSES FURTHER ON THAT HIVE-STAND; A CORRECTION.

I'm sorry the picture in May 1st GLEANINGS shows the bottom-boards of my stands projecting. I'm not good at making pictures, and didn't know how else to show where the boards were. But there is no need of my stands projecting beyond the hive, and, as a matter of fact, they do not. Sand or sawdust closes up every thing about your stands, and that feature I like. I know no reason why it could not be applied just as well to mine, and then I don't know of any advantage yours has, while mine has the advantage that the stands can be more cheaply made, leveled in less than half the time (because double), and will stay level better; and if a board rots it can be replaced separately without renewing the whole stand. As a matter of magnanimity on my part, however, I'll let you continue to use yours. Marengo, Ill.

C. C. MILLER.

JAPANESE BUCKWHEAT.

Bees have wintered well in this section. There will be a good deal of Japanese buckwheat raised here this year, as the test last season was so favorable. I think its introduction worth an immense sum of money to the country, if it does as well in the future as it promises so far. I raised 21 bushels from the peck I got of you last year, on poor ground, and one of my neighbors raised 31 bushels from the same amount bought of you.

VOLNEY WHITE.

Findley's Lake, N. Y., April 29, 1889.

HOW BEES GATHER POLLEN.

Under the head of "Pollen," in your A B C book, you say the bee "sweeps his tongue among the grains of pollen." I have peeped around them, and spied about them and under them till my neck was tired, but I have never seen him "sweep his tongue" yet. Last spring I mixed meal and flour, and put it into a shallow box, as a substitute for pollen. One day in passing by I observed a bee in the bottom of the box, digging away with his fore legs among the meal that had gathered in the top. Holding my breath that I might peep closer, I discovered that, with his front legs, he flirted the fine meal or flour among those bristles, hairs, or feathers, on his chest. When he has sufficient, he rises on the wing and then "sweeps his tongue among the grains of pollen," places it on his hind legs, and is ready to get another batch. When gathering from flowers he does the same way. The bumble-bee gathers the same way, except that he sings while flirting the pollen among his feathers.

Smithville, Mo., April 18, 1889.

J. M. AKER.

I confess, my friend, that I never could get a bee to work slowly enough so that I could be satisfied just exactly as to how he did it. Where they work on meal, however, I am quite certain that the tongue furnishes diluted honey, or something equivalent, to enable the bee to pack meal like dough, and thus form pollen masses. Its tongue is certainly a very important tool; but I am not even now satisfied what office it performs.

HIVES WITH MOVABLE COMBS OR NOT.

Friend Root:—In commenting on Question 117 you say, "A few have been bold enough to say there is no particular need that we should have frames at all—just have a shallow brood-chamber, and let the

combs be built in solid." Now, that is just the hive I am using, not from choice, but from necessity. There are some difficulties which, if I can not overcome, will compel me to buy a saw and make frame hives.

How can I prevent swarming, especially after-swarms? I wish friend Hetherington would give us a few dots on that line. How about finding out the condition of the hive as to stores, brood, queen-cells, etc.? It seems that they are much more liable to leave the hive after they are hived than if they had a frame of brood or even frames with starters. I think it would be a good idea to make the inside of the chaff hive of the thick paper used sometimes for ceiling houses, but without the varnish which is put on it. That would give porosity, ventilation, lightness, and warmth.

Cuthbert, Ga., Apr. 6, 1889.

L. A. DUGGAN.

Friend D., you can not very well prevent swarming absolutely, even with movable-comb hives; but if your boxes are shallow enough you can, by holding them up to the light, see the queen-cells, and cut them out with a long slim-bladed knife from either one side or the other. You can also, in the same way, judge of the stores. If they need feeding, instead of giving them an extra comb give them an extra section of combs. You might, with some trouble, give them unsealed brood, to keep them from absconding. Very likely, thick paper or straw-board would answer nicely for the inside of chaff hives.

THAT ORANGE-BLOSSOM HONEY.

Your kind notice of our orange-blossom honey is very greatly appreciated. We have sold about 20 gallons of it, and have left about that amount on hand. We receive for it here, in five-gallon cans, 10 cents per lb. We got about 40 gallons, same as sample, and have taken since (on Saturday, April 20) 15 gallons, a shade darker, mostly from a laurel bush. The next extracting will be from that also; then palmetto and basswood come together so close I fear we shall be unable to separate them as distinctly as I should desire. I will send you a sample whenever I get any that will be worthy of it.

Altoona, Fla., Apr. 22, 1889. JOHN CRAYCRAFT.

BEE-STINGS A CURE FOR RHEUMATISM.

Last summer I began bee-keeping, and up till then I had been troubled with rheumatic pains; but during the time I was stung by bees I never felt any pain from rheumatism. The poison from the stings seemed to cure the complaint. Do you think there is any thing in it?

F. BROWN.

Uttoxeter, England, Mar. 20, 1889.

It has been pretty well demonstrated that rheumatic pains do give way, at least to some extent, when the sufferer is stung frequently by the bees. It just now occurs to me, however, that taking a good sweat every day in the open air, out in the sunshine, might of itself have a beneficial effect on the rheumatism. We have plenty of instances where people have been greatly improved in health by taking up bee-keeping or gardening, or any other like outdoor pursuit; but I do not now remember that we have had positive proof that the patient would have been relieved by sitting in his room and having the bees brought to him so as to give him a sting, say half a

dozen times a day. Perhaps it would be well to commence with one sting a day, and then give him more as he could bear it. I should be very glad indeed to know that the latter plan has succeeded, but I am quite anxious that sunshine and outdoor exercise have their full due. When the days are so warm that I get real sweaty out in the fields, my aches and pains and nervousness almost invariably give way more or less, so I believe in living outdoors a good deal.

YELLOW JESSAMINE; A CASE OF HONEY-POISONING, AGAIN.

Inclosed you will find a clipping from our county paper, that may be of some interest to you. I am not acquainted with any of the parties, but I have no doubt of the correctness of the statement. Whether the death was caused by the poison of honey may be questioned. J. C. GRAYSON.

Wylce, Ark., April 16, 1889.

A SAD DEATH

Mr. and Mrs. Birchfield, with their 5 or 6 children, had a bee-tree cutting near here last Saturday evening. They all ate of the honey except one child, and were all soon attacked with blind dizziness, and went to the house. Maud, their little 12-year-old daughter, was taken very ill, and died in a few minutes. The rest of the family soon recovered and are now safe. Jessamine poison is supposed to be the cause. The bereaved family have the heartfelt sympathies of the Locust Bayou vicinity. J. W. HOLLIS.

Locust Bayou, Ark., April 2, 1889.

Friend G., I wish you would give us the full facts in this matter. If you will go and visit the family, and find out all you can about it, I will pay you for your time and expense.

CAN A QUEEN HATCH IN 11 DAYS FROM THE EGG?

I inclose a circular from Mr. Wallace, of Clayton, Ill., containing a statement that queens may hatch in 11 days from the egg. The statement I call in question, reads as follows:

One very curious freak in nature is, that the egg laid to hatch a worker bee can be changed to a queen, and be made to hatch in *eleven days*; but if to hatch a worker it would take twenty-two days.

In fact, at the convention at Clayton last October he claimed to usually get queens in 11 days, but he failed to convince either my friend Spencer or myself that the bees started his cells from eggs. All the books I have examined on queen-raising state the time as 16 days. Are there any exceptions exceeding, say, two days either more or less than the 16 days given as the usual time? Mr. Wallace certainly has some very nice-colored bees, and very gentle ones; but we could not tell anything about their working qualities, for in his region there was no crop of honey last season, nor for one or two previous ones. DANIEL E. ROBBINS.

Payson, Ill., April 5, 1889.

I think you are correct; in fact, any textbook on bee culture should settle this matter. The queen may possibly hatch 15 days from the egg; but as a rule it is fully 16. Your friend, without doubt, gave the bees both eggs and larvæ, and the queens were hatched from larvæ which was five or six days old.

WHAT MAKES BEES DWINDLE?

About a week ago a cold northeast wind brought a couple of chilly days. On the coldest of these days we were away from home. Throughout the

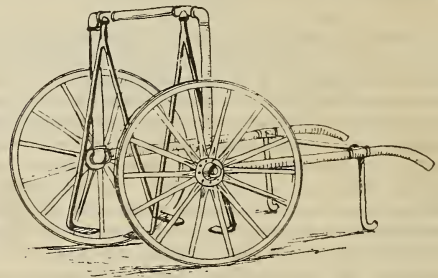
day the sun either shone hazily or was thinly clouded. When we got home we found bees in the water-tubs, bees in the chicken-troughs, bees in the buttermilk, bees in the grass, bees on the walks, bees on the pump, bees everywhere, benumbed, and unable to get home. That is what I find always dwindles bees—chilly, cloudy, damp weather. Of course, bees that are least healthy and rugged are least able to stand such weather, and, of course, the colony that is situated and packed so as to be driest and warmest will be the healthiest. High-pressure methods of stimulation, very early in the spring, also drive bees out to perish, often tearing down faster than building up. GEO. F. ROBBINS.

Mechanicsburg, Ill., April 19, 1889.

I think, friend R., that you are exactly right in the matter; and we should endeavor to have the bees stay in their hives during such weather, if there is any way to manage it.

HART'S HIVE-CART.

In moving hives, both single and double, I have often wished for some means of moving other than by hand. It has occurred to me several times that a two-wheeled skeleton barrow would fill the bill, the axle being cranked as shown in the accompanying drawing. From the cross-bar, two pieces of stiff wire or light iron rods could be hung, as shown on each side. To pick up a hive it would be necessary only to run the machine up to the back or front of the hive, and tilt the handles up until the hooks are on a level with the ground. Now slip the hooked wires under the floor-board of the hive. When



the machine is brought level, the hive will be lifted from the ground and will swing level into place, and could be easily moved anywhere, with this advantage—that one person could easily move either a two or three story hive, and it could also be easily adapted to weigh the hives, and also for an ordinary wheelbarrow by laying boards across.

There, friends, you who have to move your hives in and out of winter quarters, I think you will be glad if you could develop the idea into shape.

Avery, Iberia Par., La.

H. F. HART.

I judge from your description, friend H., that you have not yet made such a cart, and I think the principal trouble would be that a hive would swing on the bearings above, like a pendulum. It is true, this could be stopped by fastening two of the arms to the adjoining shafts; but then they would not have the feature to take up and let down the hive. If some device could be fixed, either to let them swing or fasten them rigidly, quickly and simply, it might answer a very good purpose.

OUR QUESTION-BOX,

With Replies from our best Authorities on Bees.

All queries sent in for this department should be briefly stated, and free from any possible ambiguity. The question or questions should be written upon a separate slip of paper, and marked, "For Our Question-Box."

QUESTION 124.—*Upon what do you hive a swarm—foundation, empty frames, or what?*

Foundation or combs. GEO. GRIMM.

Usually on foundation. O. O. POPPLETON.

Empty frames, and contract. A. J. COOK.

Combs, if I have them; if not, foundation.

C. C. MILLER.

Upon full sheets of foundation in wired frames.

JAMES A. GREEN.

If you make a swarm without brood, foundation is better than empty frames. P. H. ELWOOD.

I use frames filled with foundation or empty comb, but never empty frames. L. C. ROOT.

On frames with wired foundation, always putting one frame of brood and one of honey.

P. L. VIALON.

Sometimes upon foundation, sometimes upon comb, sometimes upon empty frames.

MRS. L. HARRISON.

Principally on foundation, except when I am overstocked with brood-combs that need protection; then I use combs. R. WILKIN.

Upon empty combs, if I have them; and if not, upon foundation; and if I should have none of the latter, then upon empty frames. C. F. MUTH.

Full frames of foundation, to avoid the building of drone comb, or full frames of worker comb (in preference) when we have them. DADANT & SON.

Empty combs, if I have a supply; or if not enough, use some foundation; and if no combs, use full sheets of wired foundation, made by myself on a Given press. A. B. MASON.

Empty frames, with 2 inches of foundation in each frame; give them one or two frames filled with brood in all stages of development. We hive but very few natural swarms. We make nearly all our increase by divisions. E. FRANCE.

Six Gallup frames filled with comb, as a rule, with sections from the parent colony placed over them. Otherwise I use five frames having foundation starters in them, the sections placed over the swarm as before. G. M. DOOLITTLE.

Upon empty combs, if I have them; if not, upon full sheets of foundation, every time. It has been many years since I have hived a colony in empty frames or frames with guides, except some for experiment. JAMES HEDDON.

Upon good combs, if I have them, if early in the season, and honey is coming in too slowly to secure any surplus; upon empty frames after the bees have commenced storing surplus and building new comb; not any more upon full sheets of foundation at any time. H. R. BOARDMAN.

I prefer five frames of comb and two empty frames—putting the latter near the center, but not both together. As second choice, I use one frame of comb in the center and six frames with starters of foundation in them. If my bees would make

foundation as readily as they make comb I would have them make it for sale, instead of buying it for them. For cool weather and a small swarm, I use, of course, a less number of frames than seven.

E. E. HASTY.

I rather expected some of the brethren to recommend hiving bees on empty frames, according to the plan recommended by Hutchinson, in his book on comb honey; but not even Heddon makes a suggestion in that direction. Neither does Doolittle; but friend Boardman rather hints that way, and Prof. Cook may have it in mind, but his answer is too brief for us to be very sure.

QUESTION 125.—*Does the swarming impulse come from the queen or workers?*

I guess so.

A. B. MASON.

I don't know.

O. O. POPPLETON.

From the workers.

MRS. L. HARRISON.

From both, I think.

P. H. ELWOOD.

It comes from the workers, in my judgment.

JAMES HEDDON.

Probably from the dissatisfaction experienced by both.

DADANT & SON.

I do not know. Who does? I think, from the workers.

JAMES A. GREEN.

From the workers, but is instigated by the queen or queens.

H. R. BOARDMAN.

I do not know, but I guess, as in all well-regulated families, there is an agreement.

A. J. COOK.

I think from the workers; and possibly from the fact that there is no one watching them.

GEO. GRIMM.

First natural swarm, from the workers; second, or after-swarm, with virgin queen, from the queen.

P. L. VIALON.

I guess both, and perhaps the drones too. I never knew any of them to be "backward in coming forward."

L. C. ROOT.

I think the impulse is simultaneous; just as the bees keep cells prepared for eggs as fast as the queen needs them, each inspires the other.

R. WILKIN.

It is hard to tell; but I never knew a swarm to come off unless there was a queen in the hive. But I have known them to swarm when the queen was caged in the hive. The bees returned to the hive.

E. FRANCE.

If blossoms yield, and bees are short of room to store honey, then the queen generally becomes also cramped for the want of cells to deposit her eggs. In such case (and they are in the majority) the workers start the swarming impulse, and the queen is among the last to leave the hive. C. F. MUTH.

From the whole colony, in obedience to the command of the Creator, who said, "Go forth, multiply, and replenish the earth." All hands are interested in this matter when the time of swarming arrives, and work in harmony with nature's laws to accomplish the object whereunto they were sent.

G. M. DOOLITTLE.

I don't know. Workers without a queen will never start the swarming fever, but that does not prove that the queen does. I once had a swarm issue whose queen I had taken an hour or more before, so that the presence of a queen is not neces-

sary at the immediate time of swarming; and whatever originates the swarming fever, I feel pretty sure the workers can have it. C. C. MILLER.

The swarming impulse is the general restlessness of prosperity and enterprise, and the consciousness of powers within which are not being fully occupied. It affects both queen and workers—sometimes the queen the most, sometimes the workers the most. In proof of this we have the following facts: In a weak nucleus, during hot weather the queen often swarms out when no bees will follow her. She flies around for awhile, and then goes back—or very often intentionally enters some other hive. On the other hand, a prime swarm, when it first comes out, often goes back without clustering, but comes out and clusters all right next day. There is probably more than one cause for this; but I think it sometimes is because the queen, in the first instance, would not come out. That is to say, she had plenty of room to lay, and had no gravel in her shoe at all, and saw no reason for swarming. After-swarming is evidently caused mainly by the endless row the young queen kicks up because she is not allowed to destroy her rivals.

E. E. HASTY.

I presume that many of the friends will remember that I have, in the A B C book, mentioned an instance where a queen deserted an artificial colony and went to her old home, taking all the bees with her. In that case the queen certainly started the work, and took the bees along with her. Other facts, however, seem to indicate just as strongly that the matter was all in the hands of the worker-bees; so I am inclined to think that it is sometimes by mutual agreement; at other times, by the queen alone, and still other times by the bees alone.

QUESTION 126.—*What are the necessary conditions to induce swarming?*

Warm weather, and honey, or honey prospects.

MRS. L. HARRISON.

Abundance of bees, scarcity of room, a generous flow of honey, and fair weather.

R. WILKIN.

A slight flow of honey, if the colony is strong, has some drones and plenty of brood.

PAUL L. VIALLO.

Discontent, extreme discontent. There, I believe that covers the ground, if I understand the question.

H. R. BOARDMAN.

With a well-filled brood-nest at the swarming season, a prime swarm usually issues the first pleasant day after a queen-cell is sealed over.

P. H. ELWOOD.

A colony of sufficient strength, and an assurance that the flowers will give the swarm something to subsist on till combs can be built, and stored with honey.

G. M. DOOLITTLE.

Usually a strong colony of bees, combs filled with brood, no room for the queen to lay. So far as my experience goes, bees seldom swarm unless there is a good flow of honey.

E. FRANCE.

A prolific queen in a hive too small to allow her to use her whole laying capacity, and a crop of honey which crowds her even more. The smaller the hive the more numerous the swarms.

DADANT & SON.

I don't know. A full strong colony and a honey-harvest certainly tend to do it. There may be other causes.

A. J. COOK.

A populous colony, scanty ventilation, and lack of room for the bees to store honey, and for the queen to deposit eggs.

L. C. ROOT.

Ordinarily strength of colony and a moderate flow of honey. But sometimes no conditions are necessary—they'll swarm any way.

GEO. GRIMM.

A hive full of bees, warm weather, a good honey-flow, and lack of room to store honey or raise brood, are conditions which induce swarming; but bees will sometimes swarm in the absence of any one or two of these, and perhaps lacking them all.

JAMES A. GREEN.

The necessary conditions are different with different colonies. Sometimes swarming occurs when there is plenty of room for the bees, brood, and honey. Sometimes it will not occur, even when the hive is crowded with bees, brood, and honey. Usually a crowded condition of the colony, fair weather, and a flow of honey, will induce swarming.

A. B. MASON.

I'd give a good deal to know. I think some of the necessary conditions are, abundance of bees—at least for a prime swarm. When I commenced I supposed I could reel off several, but I confess I'm not sure of another one, and I feel just a little shaky about that one. Heat, lack of room, etc., may induce swarming; but they are not necessary. I know even less about it than I supposed I did.

C. C. MILLER.

The flowers yielding nectar, and a crowded condition in the hive; crowded for the want of room to store or to breed, or both; the instinct of propagation. The above are the ordinary inducements to swarming. But there are extraordinary inducements, such as the hatching of several young queens when the old one is superseded. In such case a swarm may issue at any time.

CHAS. F. MUTH.

The conditions which induce swarming may be divided into two classes, which may, though perhaps incorrectly, be dubbed as natural and artificial. The natural causes of swarming are, season, suitable temperature, proper honey-flow, strength of the bees, and the general animal impulse to multiply the species. The artificial causes, if we may call them so, are lack of room, excessive heat, and a quarrel among a new batch of queens.

JAMES HEDDON.

The absolutely necessary conditions are few—probably only one—a turgid condition of the vessels in the bee anatomy in which are stored the supplies for future brood-rearing. Abundance of food is usually a condition; but sometimes bees will certainly swarm when, as Mrs. Chaddock expresses it, they have scarcely three days' rations ahead. Crowding is usually a condition; but my colony that inhabited a hole in the ground, twice as big as they could occupy, swarmed like other bees, to my great disgust. If what is wanted is practical directions for making a reluctant colony swarm, I should say, crowd them, boom them by giving them sealed brood from other colonies, stir them up by looking them over every day or two, annoy them by destroying their drone brood. A proper combination of these stimulants will make almost any colony swarm, I think. It is worth remembering, that

the non-swarming bees that we occasionally hear of are mostly bees that have been totally let alone for years.

F. E. HASTY.

I expected friend Hasty to say that they swarmed because they got the swarming mania, even when buried in the ground. I do not believe that I exactly agree with friend Boardman when he says extreme discontent. If ever a bee is happy it is when there is a great abundance of honey and pollen coming in; and I think they are happy when they get the swarming mania. They seem to behave a good deal as the younger ones do during a Fourth-of-July parade. They are full of enthusiasm and patriotism, even if they are not big enough to know what it all means. If friend Boardman means that they are getting too happy and too important to remain longer in cramped-up quarters, then I think I agree with him.

REPORTS ENCOURAGING.

FROM 37 TO 60, AND 1600 LBS. OF HONEY.

JUNE 1, 1888, I had 37 stands in Simplicity hives, all in very good condition. I secured 1600 lbs. of honey in 1-lb. sections; average, 43 lbs. to the colony. The season was a poor one. I increased to 60 stands; these I put in the cellar about the middle of November. I took them out April 9th to 11th. All are in splendid condition, except one that had no bees in it. I think they had lost their queen and went into the hive by the side of it. My last year's crop of honey has all been disposed of except about 200 pounds. I got 15 to 20 cents per pound.

C. ABRAHAM.

Fayette, Wis., April 27, 1889.

HONEY COMING IN FAST.

Bees are doing fine. Pollen has been coming in steadily since March 15 (except on rainy days), and the honey is coming in so fast to-day that it can be plainly smelled at the entrance. Box-elder and willow are in bloom now. We use chaff hives. We will not remove the chaff from above the bees till fruit-bloom, which is in about a week. Do you think 100 drones are sufficient for queen-rearing? We have about that many pure ones, and there are no blacks out yet.

S. F. TREGO.

Swedona, Ill., April 22, 1889.

It depends altogether on how many hives of bees you have. If there are no other drones in an apiary of, say, 100 colonies, I should think that 100 drones might answer.

NO LOSS.

Our bees wintered well, no loss. Through the favor of a kind Providence we have never lost a colony yet. I have been an ABC scholar for about three years; commenced with one old hive. I now have eight in Root's chaff hives. I winter on summer stands.

JOHN LANGLEY.

Widnoon, Pa., April 25, 1889.

I never saw a finer yield or nicer honey than orange honey this season. I have 15 gallons from three hives.

J. W. SHEARER.

Micanopy, Fla., April 18, 1889.

Bees wintered well in cellar, and are now strong and healthy. I lost one out of forty colonies.

Falls City, Neb.

GEO. W. SCHOCK.



Every boy or girl, under 15 years of age, who writes a letter for this department, CONTAINING SOME VALUABLE FACT, NOT GENERALLY KNOWN, ON BEES OR OTHER MATTERS, will receive one of David Cook's excellent five-cent Sunday-school books. Many of these books contain the same matter that you find in Sunday-school books costing from \$1.00 to \$1.50. If you have had one or more books, give us the names that we may not send the same twice. We have now in stock six different books, as follows; viz.: Sheer Off, Silver Keys, The Giant-Killer; or, The Roby Family, Rescued from Egypt, Pilgrim's Progress, and Ten Nights in a Bar-Room. We have also Our Homes, Part I., and Our Homes, Part II. Besides the above books, you may have a photograph of our old house apiary, and a photograph of our own apiary, both taken a great many years ago. In the former is a picture of Novice, Blue Eyes, and Caddy, and a glimpse of Ernest. We have also some pretty little colored pictures of birds, fruits, flowers, etc., suitable for framing. You can have your choice of any one of the above pictures or books for every letter that gives us some valuable piece of information.

THE PECAN-NUT OF TEXAS.

I have not finished up the pecans. The pecan is divided in halves like the hickory-nuts that grow in Ohio. There is a hickory-nut in Southern Texas not like that of Ohio. A pecan-tree raises a different pecan from that of its neighboring tree, either rounder, longer, or larger. A pecan-tree raises the same shape of pecan every year, and the same size.

Belton, Texas.

WM. MORGAN.

PAPA'S HILL DEVICE.

We have 32 colonies. One died, and one is very weak. I will tell you the way papa makes his Hill device. First he takes the hoops of a sugar or salt barrel, cuts two pieces 15½ inches long, and one 8½ inches long, and nails them on a little block as the drawing shows. I made the picture.



Westphalia, Ind. FREDDIE GRAEPER, age 10.

Very good; but why nail the hoops on the blocks? If they are nailed together in the middle and clinched without the blocks they ought to hold and be a little better besides.

WINTERING IN CHAFF.

I thought I would try to get the picture of your own apiary, and tell you how pa winters his bees. He does it in chaff hives. He packs the bees where they were through the summer. He has 50 colonies, which he winters in chaff hives. I have drawn a picture of one. Pa generally unpacks his bees in the month of May.



I have two colonies of my own; and my little brother, who is four years old, has one which pa gave him. I think the hive that I drew is drawn pretty nicely. The hives that pa has take the L frame. I am 12 years old, and go to school.

Cambridgeboro, Pa.

ALTON HARMON.

Yes, friend Alton, your drawing was really a better picture than our engravers have reproduced above.

DO BEES EVER LEAVE THEIR STINGS IN EACH OTHER?

I am a little boy 9 years old. Pa keeps bees. He has 15 colonies. He gets his supplies from you. Pa reads GLEANINGS, and likes it very much. I

love to read the children's department. I find by Question 108 that your correspondents, including Prof. Cook, have never seen a worker-bee sting another and leave its sting in combat. This morning I found one stung to death, and left dead on the alighting-board, with the sting of the other left fast to it. I will send the bee to you in this letter, as an answer to your foot-note to the question.

Enola, Ark., March 3, 1889. W. O. DALTON.

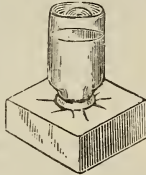
Yes, the bee has got the sting left fast to him. If you will turn again to pp. 138 and 139 you will see that we say, under certain circumstances bees do sometimes leave their stings in each other.

HOW PAPA WATERS HIS BEES.

I will tell you how my papa waters his bees. First he takes a block, one cubic foot large, and makes little cracks in the middle of it. Then he takes a glass, puts it over the can, then turns the can over so that the water runs in the little cracks, and the bees come and drink. Papa has 32 swarms of bees. One is dead, and one is very weak. Papa had to feed his bees this winter. In winter he feeds them with powdered sugar and honey, mixed. Papa is making an incubator. I thank you very much for the nice writing-paper you sent me the other time. I will try to make a picture of how the block and can look.

EMMA GRAEPEL, age 9.

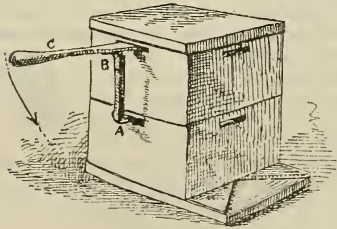
Westphalia, Ind.



Your drawing is a very good one. While it is not quite so finished as the engraving which we have made, it represents the idea just as well. We have given colonies water in this way for a good many years. For the last two or three years we have added a little salt to the water, and find that the bees will take the water much more readily.

A DEVICE TO SEPARATE SIMPLICITY HIVES GUMMED TOGETHER.

On page 90, GLEANINGS for Feb. 1, we noticed Mrs. Chaddock and her husband had trouble in removing the top story from the Simplicity hives. We will try to help them out of it by telling about the machine we use for that purpose. The accompanying drawing represents our idea. The post, B,



which is about 3 in. wide and $\frac{3}{4}$ of an inch thick, extends from the hand-hole below, where a piece of iron, A, is joined on at right angles to the post. This iron fits into the hand-hole of the brood-chamber. The post is joined to the lever, C, by a hinge, about 3 in. from the end. The lever should be 18 or 20 in. long, and flattened off at the top to fit into the hand-hole of the upper story. With this machine, which is not patented, father has no trouble in separating hives, no matter how tight they may be

glued. It should be made of hard wood. A common door-hinge will do to join the post to the lever. Galena, Ill. HALLETT BROS.

HOW PAPA GETS RID OF THE CODLIN MOTH.

I thought I would tell you how my pa catches codlin moths, and other moths and bugs. When fruit-trees are coming into bloom he gets molasses-barrels just emptied, and puts water in them. Then he takes wire cloth and makes it in the shape of a funnel, with a hole in the little end. Then he drops it, small end first, into the barrel and fastens it to the top of the barrel by bending the edge of the big end of the funnel over the chime of the barrel. In the morning he skims out the moths and uses them for fertilizer for his fruit-trees. He covers it in day time to keep out bees. GEORGE HOBBS, age 12.

Middleport, O., Mar. 9, 1889.

PAPA'S BEST HELPERS.

I herewith inclose you a drawing which I made with one of your polished cedar rubber-tipped pencils. These scenes were enacted last summer in my father's apiary, about the time P. Benson went west. We were talking about what became of him just as I was about to bend the little tree over (as seen in first scene), in order that it might be reached and pulled over so that the swarm of bees that had clustered near the top might be shaken down in front of the hive. As I was creeping out a little further, the tree broke, and down came tree-top, bees, and all, in a bunch together, without a sting. Father remarked, "That is what became of P. Benson."



SWARMING AND HIVING, IN TWO ACTS.

Father says that his best helpers in the beeyard are the fountain-pump and my little sister Ella, who may be seen in the drawing. The fountain-pump is used to bring down the swarm, and sister Ella brings the bee-veil and brush when needed. Father adds, that every scientist should have these helpers in the beeyard, and a copy of Pilgrim's Progress in the home. WALTER A. CHAPMAN.

River Falls, Wis.

Your drawings were very good, and we have tried to reproduce them as nearly as we could. It is a little remarkable that you were not stung nor hurt, and we are all very glad of the happy result. An accident from which no great harm results is often the best kind of a warning against the repetition of another, the result of which might be tenfold worse. It is not safe to risk our bodies on limbs of questionable strength, particularly when after a swarm, for angry bees may add to a broken arm hundreds of stings.

SPECIAL DEPARTMENT FOR A. I. ROOT, AND HIS FRIENDS WHO LOVE TO RAISE CROPS.

MARKET-GARDENING AT THIS DATE.

THE present year, 1889, just now seems to bid fair to give the working classes every thing in the way of garden and farm produce at lower prices than have been seen before for a long time. We have had an abundance of almost every thing all winter. Apples sold until the first of May for from 25 to 40 cents a bushel. Excellent dry beans sold lower than for many years, and we have had beautiful eclipse beets on our wagon all winter at only 15 cents a peck; and this 7th of May I should be very glad indeed to sell 100 bushels at 15 cents a bushel. We have had nice cabbage all winter long for about a cent a pound. Toward the first of May good solid heads ran up to 5 cents a pound. We have beautiful solid heads of red cabbage, even now; and I wonder if anybody else has noticed that red cabbage keeps perfectly sound better than any of the white kinds. I should consider it an acquisition if I could have a white cabbage as hard and solid as the red, and that would keep so until the following May. We also have carrots on our wagon that were raised last year. Celery has been sold at 10 cents a pound all winter, and we have some now growing in the greenhouse. We have sold lettuce every day in the year. There is a very fair demand for it now at 15 cents a pound. Onions have been a drug, and there are said to be 1000 bushels in our vicinity now, without a purchaser. We have sold parsnips every day all winter until up to the first of May, and now we are lugging them out of the cellar and feeding them to the Jersey cow. Potatoes, I am told, are *given away* in our vicinity. We now get 30 cents a bushel for Snowflakes, with the sprouts broken off. Salsify has been about like parsnips, only we get 5 cents a pound for it where we got only one for parsnips. Spinach still brings 10 cents a pound, and we have for the first time succeeded in wintering it over nicely. It was sown so early last fall that it was fit to use before winter set in. We have sold it all winter; and although it had no mulching at all, the injury done by frost was very little. Just now the wintered-over plants have made a large fleshy stalk just above the root. In gathering it we cut it just below the ground, then wash it and place it in the basket with the root part uppermost; and the reddish pink of the root and stalk makes it very attractive. This fleshy part is also very rich and delicious. Spinach has found a permanent place in our Medina markets. We succeeded in having good winter squashes until some time in February. Tomatoes of our own canning sell very well the year round. We save our tomato seed from the tomatoes that are canned; that is, we pick the choicest specimens of fruit, prepare them just as we do for canning, then scrape out all the seeds, saving them, and canning the other part. By this means we kill two birds with one stone. The seeds give us a profit, and the tomato sells for

enough to pay the expense of canning and gathering the fruit. The great canning factories, however, have reduced the cost of canning to so low a figure, that, were it not for the seeds we save, I am not sure that we could compete with them. Turnips are also on our wagon, but they sell pretty slowly.

Now during this season of great plenty there are three things of which we have not had enough, and that have brought and still bring excellent prices. These three things are asparagus, radishes, and lettuce. Last spring, for the first time we sowed some seeds of the Palmetto asparagus with a view of selling plants. We have had a good trade in the plants, and I am greatly surprised to find them sending up remarkably strong shoots even before our oldest asparagus. In fact, I had decided that, if one did not care any thing about the vigor of the plants, he might have asparagus for the table from the seed sown the *season before*. Well, in the *Orchard and Garden* for May I find the following:

"I have sold good average asparagus, one year from the sowing of the seed."

Of course, the ground must be up to the highest state of fertility. Our seed was sown on a strip of ground that I had manured up specially for strawberries. It was a sandy loam on the creek bottom. What made me think it would raise good asparagus was that some remarkably fine shoots came up along the creek before the ground was cleared up at all. I do not know that I ever saw or heard of asparagus being a drug in *any* market. Very likely it will be, however, very soon, especially after what I have said here about it.

The finest radishes we ever raised were from seed purchased of Stokes & Johnson, of Philadelphia. It was Wood's Early Frame. Every seed produced a nice-shaped radish. The seed was planted in the open air, in a spot protected by our buildings. I think it was sown about the middle of March. All insects were kept from troubling by the use of lime and guano, as mentioned last month.

To supply the demand for lettuce, we are obliged to gather our Boston Market a little before it makes any nice head.

We find the following in the *Orchard and Garden*, in regard to Henderson's dwarf lima bean:

We have already spoken highly of the new dwarf lima bean. We did not speak by the catalogue, but by practical experience, for it was grown here last year. Its chief merit, aside from its bush habit, is its earliness, and almost its only drawback the small size of the beans themselves. In quality they are not a whit behind the old sort, but are in fact rather better. Having secured the habit in the earliness, two important points for Northern culture, our cultivators will not be long in gaining size for it.

It seems we are going to have at least a few of Kumerle's dwarf lima beans, as the following note from our jovial friend Livingston (the man who has given us so many nice new tomatoes) indicates:

Mr. Root:—Have you found any one to reduce your surplus of gold by sending you that ounce of Kumerle's dwarf lima beans? If not, we may accommodate you if our grower has not already sprouted the beans. We were fortunate enough to

secure early a very few packets. We prize them, but *might* divide "for gold."

A. W. LIVINGSTON'S SONS.

Columbus, Ohio, May 3, 1889.

Some years ago I purchased half a peck of what is called Dreer's Improved lima bean. The beans were excellent, and they were packed so close in the pods that they squeezed the ends of many of the beans so as to be square, unlike an ordinary lima bean. In flavor they equaled if not excelled, any thing in the way of lima beans we have had on our table. I dropped them because I thought they did not yield as many bushels per acre as the common limas. Well, when I first saw Kumerle's lima bean they struck me at once as being remarkably like Dreer's Improved lima; and now it transpires that they are a sport from the latter. Those who have seen them growing say they grow about two feet high. I should think they would be liable to be blown over during fierce storms of wind and rain. We will give you a photograph of the plant in a few months, nothing preventing. Those who have not a paper of Henderson's Improved lima bean will have to send in their orders now very soon, for we shall have them all in the ground that are not sold, certainly as soon as June first.

Just one thing more in regard to Kumerle's lima bean: If the seed is now worth *its weight in gold*, we can not well afford to wait till 1890 to get a new crop. As GLEANINGS makes its way to localities where the sun shines at midnight, possibly it reaches some one who could take the beans as soon as they ripen here, plant them, and get a new crop ready to plant by the first of next June. Perhaps friend Poppleton, away down in Cuba, could manage it. If any one else whose eyes rest on these pages lives where lima beans may be raised in the winter time, will he please communicate with us?

Later.—Well, we have got them at last. Six packets of the Kumerle lima beans—each packet containing 25 beans. But to get them we were obliged to balance them with gold coin, and the 150 beans cost us just \$78.00, or a little over 50 cts. a bean. Never mind. If it is not wrong to "count chickens before they are hatched," we might speculate that each bean should raise us 50 more beans.* Then in the fall I should have, from my 150, 7500, which will probably give one bean to each subscriber, who cares about bush lima beans, for the year 1890. Now, some of you may think that this is awful, to pay \$78.00 for a handful of beans; but there is something I rather like about it. Along in my talks about what to do, I told you a gardener or fruit-raiser had a perfect right to get all he could for his product. If he can produce strawberries under glass so as to have them when nobody else has any, he has a right to have a dollar a quart if he can get it. And in the same way, if you can produce a crop of any thing when everybody else fails, it is perfectly right that you should have just as much as anybody will pay you for it; and if you have

sole control of some new and valuable variety of vegetable, for which there is universal want and demand, I am glad to see 50 cents—yes, or even a dollar—offered for a single seed. There are doubtless more of these Kumerle beans in the hands of seedsmen; but very likely they are not to be bought—no, not even for their weight in gold.

Later.—Here comes a bush lima bean from Nebraska:

Friend Root:—I see you are very much interested in bush lima beans, so I will send you a sample of some from Nebraska. How do they compare with Henderson's, Landreth's, and other bush limas? Please let me know what you think of these Nebraska limas. If you desire, I will tell you all I know about them. S. H. BEAVER.

Tamora, Neb., May 6, 1889.

Why, friend B., your sample of beans looks exactly like Henderson's, only they are considerably larger. If some one had picked the very largest beans they could find, out of a good lot, they would be exactly like those sent, as near as I can tell. By all means tell us all you know about them, and tell us how many beans you can get hold of.

May 9.—We have been having the most beautiful May weather for four or five days. The sun rises away up in the north, and pours its genial rays from half-past five in the morning until seven at night. I do not know that I ever enjoyed any thing in the line of God's gifts more than I have the sunshine and the open air this morning. The apple-trees are in their bloom, and the bees were tumbling before their hives with great loads of apple honey, before the sun was up. I do not know that I ever noticed this before. It is, perhaps, owing to the fact that we have had no dew for four or five nights now in succession; but as the ground was soaking wet before this warm spell came on, nothing seems to mind the scorching rays, even at noonday, unless it is our newly transplanted cabbage and celery plants from the seed-bed to the plant-garden. We have to water them and shade them, or else they would soon "go dead." Well, I have been down in the creek bottom, planting our novelties. You see, we sent for almost all of the novelties advertised in the catalogues. Then it is a nice little task, I tell you, to plant them carefully, and label them. We think it is almost as important to tell whom the seed came from as to tell what it is; and we also want the stake at the head of each row to tell what the seedsman claimed for it. For instance, Burpee has a new black wax bean. The seeds were twice as large as our old black wax. He claims that they are a great deal earlier, have larger pods, and are more productive. Now, when the beans begin to get ready to gather, I do not want to be obliged to lug a great lot of catalogues down into the field to see what the introducer claimed for them when we made our selection of seeds last winter. Well, Burpee has fixed it all nicely for us. His seeds are put in paper so stout that it is almost like cloth; and all he claims for the contents is plainly printed on this same stout paper;

* If they give 100 or more, I shan't complain.

therefore, all we have to do is, when we are ready to plant, to pour the seeds out of the package into a little shallow tin basin. Then the empty paper is wrapped round a stout stake, and fastened by four tacks. This was my part of the business. The stake was then driven into the ground so far that even a smoothing-harrow would not break it off nor pull it up. Then the basin of seeds was set down against the stake. One of the men then followed and put the seeds in, covering them with nice mellow dirt. Our ground was first prepared by plowing, harrowing, and rolling; then with the seed-drill we sowed phosphate over the whole surface. Lastly it was marked with our disk marker. This puts the whole field in regular order; and all kinds of seeds can be planted rapidly and systematically. The ground was marked over all the same. The melons, squashes, cucumbers, etc., were put in only every other row. Sweet corn, peas, and the regular crop of beans, are sown with the seed-drill, at the same time that we sow the phosphate.

Now, there is one more thing that makes our creek-bottom ground very pleasant. It is that spring that I have told you so much about. During these hot days, pure limpid water is constantly pouring over the sides of the sewer-pipe that is set over the spring. To keep the sun from shining directly on the surface of the water, a tin hood covers the sewer-pipe. This hood is painted, so it does not look unsightly. It also keeps grass, weeds, and dust, from blowing into the spring. The hood opens on the north side. Some steps go down to the spring, and a tin dipper hangs on a little bush right beside it. When one is tired as well as thirsty he can sit down on the lowermost step as he dips the water from the spring, and drink leisurely. How deliciously cool it is! If one's hands and face are sweaty and dusty, there is nothing to hinder dashing the cool water over both. If there is anything in this world that fits the little line,

"A thing of beauty is a joy for ever,"

it is that spring. It is almost in the center of the grounds, so that the workmen have but a little way to travel whenever they need a drink. We do not have any jugs nor tin pails to lug around and get lost. You will remember that we should never have known of this spring at all had we not searched diligently for it; and I think that you too might have a spring of water right out in the lots if you would only hunt it up. "Seek, and ye shall find," the Scripture says.

Yesterday in the afternoon, when the weather was so hot, I raised the lid of the well by the windmill. Sure enough, that faithful and untiring worker had pumped the water out, clear to the bottom, and another beautiful little spring was seen down at the bottom of the well, bubbling and gurgling as it ran out of the rocks and between the bricks, down into that little central basin where the pump was sipping it up as fast as it could run in there; and off in the lot adjoining, the Jersey cow was enjoying herself in sipping the water from her

tub. Then as the tub overflows into the carp-pond, the carp were probably enjoying their share of the water that pours, winter and summer, into that, to make up for evaporation and seeping. Thus you see, if you can not have a spring on the top of the ground, you can have one down at the bottom of the well; and I think you want a windmill to pump the water out so as to keep the stream running, if you want to have it nice. The windmill has been going for almost two years, and I do not remember that it has ever yet disappointed us for one hour. Of course, there have been some days when the mill did not run very much; but there has always been water enough ahead. Only last evening my wife remarked that the windmill was running slowly, when scarcely a breath of air could be perceived. It turned fast enough, however, to keep a slender stream of water running.

HOW WE RAISE POTATOES IN THE AMERICAN BOTTOM.

Lest some of the readers of GLEANINGS are not acquainted with the location, I will say that the "American bottom" is on the east side of the Mississippi, opposite St. Louis, and extends north to Alton and south to Chester, and has a depth, back from the river, of from 5 to 14 miles. The soil chosen for potatoes is usually the dark sandy loam. Very late fall plowing is the rule for at least half of the potato crop. The fall-plowed ground is used for the very early planting. The planting here begins just as soon as the frost is out of the ground (sometimes in February). A word about seed. With very few exceptions the farmers of the bottom never plant potatoes for seed that they have raised. They buy seed from the North, or of farmers on the bluff who raise their potatoes under straw. Our own potatoes do not make as strong a growth as the imported ones. Our standard potato here is the Early Ohio, and next comes the Early Rose and Beauty of Hebron. For late potatoes we have the Mammoth Pearl and the Peerless.

On account of the rapid and continued growth of weeds, the potatoes are always planted in checks and cultivated each way. They are still dropped and covered by hand. As soon as the potatoes are up enough so that the row can be followed they are gone over with the bar-plows, and two light furrows of dirt are thrown on each row. The ridges are then dragged over with a rail, and partially leveled down. This destroys all the weeds, and at the same time seems to benefit the potato. The second and third cultivating is done with the one-horse cultivators; the fourth with the bar-plows; and to lay them by we use a large single shovel and run once between the rows. But before the time of the last plowing the bugs will claim some attention or claim the crop. The only way we have been able to circumvent their ravages is by poisoning them. One teaspoonful of Paris green to two gallons of water, sprinkled over the vines as often as necessary will do the work. It would be quite a large undertaking for a man to hire the bugs picked off from a fifty-acre patch. The potatoes are now laid by, and the next process is the digging. We still rely on the hoe, the digger being paid by the barrel, 3 bushels, at from 8½ to 20 cts., according to circumstances. The digging begins about the middle of June, and

continues until late in the fall, digging at whatever season they can do so most profitably.

Venice, Ill.

G. W. T. REYNOLDS.

GOD'S GIFTS.

I agree with what John Craycraft says, Oct. 15, 1888—give us the "garden sass." This makes me think, I can raise seed of certain vegetables here to good advantage without their mixing, if I could sell it after I have raised it. I have been, the past three years, using muck in privy and hen-house, as mentioned in your book, What to Do, and find it the best and cheapest absorbent (except road dust) I ever used. I am using it this winter behind my two cows. A good panful, sprinkled on the plank after cleaning out each day, keeps the stable clean and sweet. I draw it out in August, when the water is low, pile it up, and let it freeze one winter, then dry it, then put in boxes or barrels up off the ground, and under cover. When it is dried and ground fine, like sawdust, it is a great thing to keep out frost. I have about two acres on my ten-acre farm (one of God's gifts), of peat and muck land, all the way from 1½ to 3 feet deep, which is easily drained, is perfectly level except for bogs, and covered with grass.

R. B. KIDDER.

Columbus, Wis.

THE TURNIP THAT STANDS IN THE GROUND ALL WINTER, WITHOUT HARM.

Our readers may remember that Abbott L. Swinson, of Goldsboro, N. C., sent me some of the seeds of this, last fall. The turnip is a cross between our well-known seven-top turnip, which has been raised so largely for bees and greens, and one of our other varieties producing a bulb. Well, I am happy to tell you that this turnip is a success. They stood in the ground all winter, apparently without injury; and now they are furnishing just as many blossoms for the bees as I ever saw in the seven-top turnip. The bees are humming on them now, this 11th day of May. We propose to save the seed from the whole crop.

AN EARLY PUMPKIN FOR PIES.

In response to my inquiry, 13 friends sent me seeds of an early pumpkin. That they were not all the same thing, is pretty evident from the seeds. In fact, the seeds seem to indicate that scarcely two of them were alike. We have planted one hill of each, labeling it with the name of the person sending it, and in due time we propose making our report.

FEEDING IN THE CELLAR.

CARRYING BEES THROUGH SUCCESSFULLY, WITH NO STORES AT ALL TO START WITH.

I HAVE a little report to make, which may be of advantage to others who get caught in a tight place. We have had in this locality two very bad years for honey; 1887 found us in the fall with plenty of bees and nearly empty hives, so far as honey was concerned. I fed up and brought my bees through the winter on a mixture of honey they had in the hives, and syrup. Spring came, and opened out well. Every thing was lovely till the first of June, when the fact dawned on us that there was no white clover in the country, and the alsike had no honey in it. July arrived, and a little basswood came in. None, however, was stored in

the surplus apartment. A few, say 5 or 6 out of 23, swarmed. When the last of September came, the hives were full of old bees, no pollen, and very little honey. I divided it equally among them, after doubling the lighter ones up, till I had only 20 swarms left. I was very busy with my practice and building, which occupied my time, and I saw little of them till a warm day, the 6th of November, when they were having a good fly. I looked them over to see how they stood for provender. To my surprise I found they had already eaten up 75 per cent of what I had allowed them 6 weeks before. I went to work and took all the honey in the apiary, and gave it to six hives and put them up in chaff hives for winter. The rest, fourteen in number, I carried to a north room in the cellar, darkened the windows, and made up my mind, contrary to all rules, to save my swarms. I took off the supers, and cloth off the top of frames, laid one frame flat on the rest, and once a week I opened the doors from the furnace into the rest of the cellar; and when the heat got up to about 65 I went in and fed them, giving each hive less than a teacupful of syrup. The next morning I shut off the heat by shutting the doors, and let them alone a week. Temperature during the week stood at about 50°. This I kept up till April 15th, when I saw pollen coming into the hives outdoors. I brought them from the cellar. I had concluded they were very light in bees. Two of the fourteen were; the rest are good average swarms, covering, when in cluster, from four to seven Heddon improved Langstroth frames. On the whole they are not as well, as strong in bees, nor as far advanced, as those I left out in chaff hives.

Honey is now coming in from the soft maple. One hive I examined this afternoon had several combs, outside of those with eggs, filled with nectar, and the margin of seven frames that had eggs and larvæ in the center were completely filled. I would not advise a novice, nor, in fact, any one, to try the experiment. I had every advantage. I could heat their room as I liked, and as often as I liked. Another thing I proved, too, was the fact that light is no detriment. I happened to be going by the door once in day time, and observed that the sodding I had up at the basement windows had settled 2¼ or 3 inches, by the frost having gone out, making it as light as day. As the sun was pouring in this opening, to my surprise the bees were as quiet as in the darkness of the night, with no cloth over them, and the thermometer at 46°. I always took a light, a common lamp turned up, and set it down in the middle of the room, and there was seldom a bee that left the hive; never more than two or three during any time I was feeding them.

DR. A. E. HARVEY.

Wyoming, Ont., April 18, 1889.

Friend H., with a furnace in the cellar to dry it off and warm it up, it is not any wonder that you succeeded; and in regard to the matter of light, when bees are in a state of *perfect health* I do not know why they would be any more likely to fly out at a temperature of 46 in the cellar, than if they were outdoors. Bees in health seldom go out of their hives unless the temperature of the air runs to about 55. If the sun shines, they often go out in sunny nooks; but it is because the sun raises the temperature, and not because the light entices them.

MYSELF AND MY NEIGHBORS.

I know that my Redeemer liveth.—JOB 19:25.

DEAR friends, I have thought best to submit to you to-day a sermon that was preached in our pulpit a few weeks ago. I have decided to do this because the question has come up so often, "How shall I know that I am a Christian?"

CHRISTIAN ASSURANCE; SERMON BY REVEREND NORMAN PLASS.

Examine yourselves whether ye be in the faith; prove your own selves.—II. COR. 13:5.

A question that is often asked is this: "Can I know whether I am a Christian or not?" It is variously answered. One will tell us that he has an abiding and blessed assurance that he is a child of God; another will say that he is confident of it at times, while again the light of his hope grows dim and he is left in doubt. Still another will say that he has never experienced an assurance that his name is written in the Lamb's book of life. The first confidently exclaims with Paul: "I know whom I have believed." The second, while at times appropriating these words, is at the next moment ready to exclaim with Thomas, "We know not." The third is like the heroine of "*Miss Toosey's Mission*," who, although a sincere Christian, yet when in time of revival the presiding clergyman "invited all those who were conscious of conversion to remain, and the rest to leave, without a moment's hesitation went out, and found her way home, sobbing and broken-hearted."

Were the question, "Do I know whether I am a Christian?" it would be thus variously answered. But it is a question of *possibility* and *privilege*—"Can I know?" As thus asked, we can best answer it by considering some of the *conditions* we have to fulfill in order that we may be Christians, and by deciding whether or not we can know that those conditions are fulfilled. I hold that it is the privilege of every believer to know whether or not he is saved—and not only the privilege, but the *duty*, for the words of our text come to us in the form of a *command*: "Examine yourselves, whether ye be in the faith; prove your own selves."

The basis of the Christian life is a *belief*—not a mere *intellectual* belief, implying simply assent to a proposition or truth, but a belief that *implies a surrender of the life*. It is such a belief as the wife has in her husband—a belief not merely in his integrity and sincerity, but a belief that leads her to *surrender herself*, to a large extent, to his care and direction. Not only is it the *privilege* of the wife to know whether she thus believes in her husband, it is her *duty* to know before she makes the surrender. In like manner it is our own privilege and our duty to know whether we exercise *self-surrendering belief in Christ*. Why can we not know just as well as the wife whether we exercise such a belief or not? This implies a surrender of the *affections*. What would you think of a woman who should say that she didn't know whether she loved her husband or not? It's her *duty* to know, even before she becomes his wife. Should not, then, Christians, who as a body are called "the bride" of Christ, know whether they love Christ or not?

We speak of "a change of heart," or "the new

birth." What is the change of heart? Simply a *change of affections*. A person says: "I don't realize that I have had a change of heart, so I don't believe I could have had, for I should know it if I had, wouldn't I?" That depends entirely upon what you make the *standard of your judgment*. If you have expected to feel your *fleshy heart* gradually passing away and another heart taking its place, you no doubt have failed to witness the change. If you expect a great upheaval of your emotional nature, followed by a great influx of feeling and untold joy, you will no doubt be disappointed, and conclude that the change has not come. Such an overflow of feeling results only upon a great change in *belief and life*; and with most of us, when we become Christians, there is a change neither in belief nor in life, but only in the point of *surrender*. A young man who was troubled at this point came to his pastor. After a few words the pastor asked, "What do you understand the heart to be?"

"The affections," replied the youth.

"That is correct. Now, are you sure that your affections have not changed? Did you love to pray a month ago?"

"No! I was accustomed to pray, but it was a mere formal duty."

"Is prayer a pleasure to you now?"

"It is, decidedly."

"Did you enjoy association with Christians then?"

"No! not at all. I shunned them."

"Do you shun them now?"

"No! I like to be with them."

"Do you love to read the Bible?"

"Very much."

"Did you a month ago?"

"I can't say that I did."

"And can't you think of several things that you used to find pleasure in that you don't care for now?"

"Oh, yes! very many."

"Can't you see, then, that you have met with a change of heart? If by the heart is meant the affections, and your affections are changed from what you once loved to what you once hated, so that now you care not for the former and hate the latter, you have certainly experienced a great change of heart."

Here was a clear case. All that young man needed was to understand himself. Whoever can answer those questions as he did, has certainly been born again. With some of you, there may be but a *single* indication of the change that you can now discern. You may enjoy the prayer-meeting now, whereas you didn't before. A young man who is seeking Christ, but who doesn't think he has found him yet, said to me a few evenings ago, after the prayer-meeting, "I never enjoyed a meeting like that before." Is not that an indication that he has found Christ? You may like to be with Christians now, whereas you shunned them before. Take these new affections as indications that you have been born again.

But a person says to me: "I have always had these feelings. I never thought that I hated God. I always liked to read the Bible. I always loved to associate with Christians. Yet I never felt that I was a Christian." But if your affections are upon these things, you *are* a Christian.

"What!" you exclaim, "could I be a Christian and not know it?"

Yes, I think you could. You can't be a *full-grown*

man without knowing it, nor can you be a *fully developed Christian* without a knowledge of the fact. But you can be a *child in Christ, and know nothing of it*. You spent many months of your life before you realized your existence in this world, and came to the consciousness that you were a child. So it is possible for a person to have been born again a long time before he has awakened to a consciousness of the fact. Do not call in question the possibility of your being a Christian because you can not trace the beginning of the Christian life, any more than you would question your physical existence because you can not trace the early months of your life, or can not remember when you were born. There are a great many people, recognized as earnest and sincere Christians, and themselves conscious of a change of heart, who are compelled to confess that they can not mention a time when they gave their hearts to Christ. What a great many need is to *realize that they are already Christians*, because they love God and the things of God; and all that they need further is to come out and confess Christ before the world. A gentleman of my acquaintance was very ill, and not expected to live. For two weeks he seemed at the point of death. He had been a godless man, and during that time I spoke frequently with him regarding Christ. He seemed to make a complete surrender, and told his friends that he had found Christ. At length he grew better, and then we discovered that he could not remember a single event of those two weeks—not a single call, not a circumstance, not a word spoken, could he recall. Yet, when he came to himself, it was with the joyous consciousness that he had found Christ. The weeks themselves were blanks, yet in those weeks he had been born again, and afterward the consciousness of that fact was his. Is it not true of us, that in one event of life or another, we sometimes *unconsciously* yield up the point that separates between us and God, so that we become truly his, and all that we need is to come to ourselves and realize it?

We spend too much time in examining our own hearts. We might conceive of a crazy man cutting out a friend's heart and dissecting it to discover whether or not the friend loved him. Would he ever find out in that way? Yet in much the same way do we often go about examining our own hearts to discover whether or not we love God. While the seat of the affections is in the heart, we might spend a lifetime in examining it, and yet never find the affections. Don't let us stop and look at our hearts to see whether they are old or new, but let us look out toward God and ask whether we want to please him by doing his will; and if we do, then are we *friends* of God; and if friends of God, then surely we have been born again. We know whether we believe in Christ with the belief of self-surrender, and if we do, that's enough—let us go on and do what he would have us, and leave the matter of a *new heart* with Him who created and whose it is to *re-create*. If we have thus done our part, we can have the assurance that *God will do his part toward making the heart new*. There may be no wonderful transformation, there may be no sudden change, there may be no great revelation of light, but we have simply to decide the point of self-surrender to Christ, leave the rest with God, and go straight ahead.

We sometimes call the Christian life a *vocation*. Can we not know whether we have entered upon

that vocation or not? That is not a question hard to decide in other vocations—why can we not decide it here? In a little book entitled, "Being a Christian," by Dr. Gladden, I find this illustration: "Ask a man what his business is, and he will answer promptly enough, 'I am a carpenter,' or, 'I am a lawyer,' or, 'I am a druggist,' or, 'I am a machinist,' as the case may be. The carpenter does not say to you, in a sad, uncertain tone of voice, 'I don't know; I have been trying for five, ten, or forty years, to be a carpenter, and I have sometimes hoped that I was one; indeed, there have been seasons when I felt quite sure of it; but I am often in great doubt. He may say, indeed, 'I am not so good a carpenter as I might be; I have seen nicer workmen; but I can do a pretty fair job, and I am not ashamed of my trade. It is one that I freely chose, and that I have done my best to learn; and I shall work at it as long as I live, if I can find employment.' Surely there is nothing presumptuous in saying as much as that. A man who did not have his mind made up about such a matter, and who did not know his own mind, would never accomplish much in this world." Why, then, is it not just as possible and just as essential that a person should know that he has chosen the *Christian* profession, that he has entered upon the *heavenly* calling, even though as yet he may be only an apprentice at the trade? If uncertainty seems strange in the one case, why not as unaccountable in the other? If we have chosen the Christian calling, and are working at it every day, trying to improve and perfect ourselves in every way possible, we certainly ought to know the fact. One reason for so much uncertainty, just in the line of this comparison, is because we don't clearly understand what we are about when we set out in the Christian life—we don't comprehend that we are *choosing a life calling*, and hence should *know our choice*. Another source of uncertainty, here suggested, is portrayed in the boy's remark, when asked whether his father was a Christian. "Yes," he replied, "he's a Christian, but he a'n't working at it much." We don't work at our trade constantly enough to keep our zeal up. A man who didn't work at the carpenter's trade more than half a day a week might well question sometimes whether he were really a carpenter or not. A carpenter who never did, and never tried to do, a good job, might well be declared by his fellow-men to be no carpenter at all. How, then, about professing Christians who are only half-hearted in their work? Can they be called Christians at all? If not, how about their assurance of the fact? Another source of uncertainty is because, when we *fail* at some point, we conclude that we were mistaken and are *not Christians at all*. But when our purposes are good and our endeavors earnest, are not our failures excusable, just as the carpenter is excusable when he does the best he can, although he may not do quite as good a job as another carpenter? We should know that we have chosen the Christian calling; we should steadily persevere in it; and when mistakes occur, rise superior to them and press resolutely on "toward the prize of the high calling of God in Christ Jesus."

Can we not tell whether or not we are *spiritually blind*—whether we have received *spiritual sight*? Think you that any blind man whom Christ healed would be uncertain of that healing? Are we told of any who said he didn't know whether he could

see or not? You recall one whom the rulers of the Jews attempted to confuse, telling him that Christ was a sinner and could not be divine, threatening to excommunicate him, accusing him of forsaking Moses, to all of which declarations and accusations he replied: "Whether he be a sinner or no, I know not; *one thing I know*, that, whereas I was blind, now I see." Can't we know that much, however many points of theology we may be uncertain of? Possibly we are more like the man whose eyes Christ touched, and then asked if he saw aught. To which he responded: "I see men as trees walking." Then Christ again touched his eyes, and he saw "every man clearly." If we have even a little spiritual sight, can't we know it? If our vision is fully restored, how can we help understanding it?

Have we not ground for believing that we can know whether we are called or not, in the very character of Christ? For illustration, suppose that Dr. Pasteur's theory of inoculation to prevent hydrophobia were found to be an assured success, and that, having never fully declared the secret of the cure, Pasteur should decide to make it known to the world, so that any who had need could at once apply the remedy. But he declares the secret in words so technical, or so indefinite, or so unmeaning, that not one in a thousand can comprehend what he means. A poor fellow has been bitten by a mad dog, and is trembling in fear of approaching death, and knows that here a sure cure is spoken of, but he can't understand just what to do. He does as he *thinks* he is directed, but can't be sure, and waits in dread anticipation to see whether the rabies will seize upon him. Rather than extol Pasteur as a benefactor, would you not rather condemn him because he made known the remedy in such uncertain terms that men can not know whether they have properly applied it or not? What, then, would you think of the "great Physician" if he should set out to declare to the world a remedy for the malady of sin, and should be so indefinite in his declarations that those who feel the dread poison coursing through their veins, and are crying out to be saved, could not understand what the remedy was, and could not know till death began to creep upon them that they had failed to comply with those conditions? The very character of Christ compels us to conclude that we can know whether or not we have fulfilled the conditions of eternal life. We find the directions very explicit—"Whosoever *believeth*—shall not perish, but have everlasting life;" "Verily, verily, I say unto you, he that *heareth* my word, and *believeth* on him that sent me, hath everlasting life, and shall not come into condemnation, but is passed from death unto life"—no future translation—"is passed," *even now* new life is coursing through his veins; "*Hath* everlasting life," not, "*shall* have," or, "*may* have," but "*hath*"—a present possession, a present reality, and should be a present assurance.

The Bible reveals to us a number of tests, by which we can know whether we are Christ's or not.

I. John 3: 14.—"We know that we have passed from death unto life, because we love the brethren."

Rom. 8: 16.—"The Spirit beareth witness with our spirit, that we are the children of God."

I. John 5: 10-12—"He that believeth on the Son of God hath the witness in himself—and the witness is this, that God gave unto us eternal life, and this

life is in his Son. He that hath the Son hath life; he that hath not the Son of God hath not life"—so reads the Revised Version. Note, the change in the words underscored—"and this is the record," of the A. V., is changed to "the witness is this," in the R. V. We are not compelled to probe our hearts for the witness. We have the "witness within ourselves," to be sure; but, likewise, "The witness is this, God hath given to us eternal life—He that hath the Son hath life." Have you the Son? That's the question. If you have received the Son, you have life. "These things," adds John (v. 13), "have I written unto you, that ye may know that ye have life." Just take your Bible and read the whole of this *First Epistle of John* if you want to know whether you are Christ's or not. When you have finished, I am confident that you will exclaim with Paul: "I know whom I have believed, and am confident that he is able to keep that which I have committed to him against that day."

Now, don't be discouraged if you have not this assurance. Do not therefore conclude that you are not a Christian. Only know that it is your blessed privilege to have it, and be not content till it is yours. "Give diligence to make your calling and election sure." "Examine yourselves, whether ye be in the faith." It is your duty to know. Of course, you may be a Christian without this assurance. A letter may be written, and yet remain unsealed. A child may be heir to a large estate, and yet not have the full enjoyment of it. A weak faith saves, though it may not give the assurance of salvation. Many noted Christians have never experienced this blessed assurance. Some one spoke to Archbishop Leighton of his assurance. "No, truly," he said, "I have only a good hope, and a great desire to see what they are doing on the other side."

"You have your feet upon the Rock," said a friend to Wilberforce.

"I do not venture to speak so positively," replied the philanthropist. "but I hope I have."

But is it not our privilege to know whether we stand upon the Rock or not? "Whosoever *heareth* these sayings of mine, and *doeth* them," says Christ, "I will liken him unto a wise man which built his house upon a rock." Can't we know whether we hear the commandments of Christ, and, as best we can, do them? When Philip de Morray was asked, in old age, if he had a hope of future bliss, he replied: "I am as confident of it from the incontestible evidence of the Spirit of God, as I ever was of any mathematical truth from all the demonstrations of Euclid." Can we not at least attain to a degree of confidence such as this?

Sometimes this comforting ray from the eternal Sun of Righteousness is brighter than at others. Our physical condition sometimes causes despair, as it did to Elijah when he reclined exhausted beneath the juniper bush in the desert, and requested that he might die. The state of one's health, even the weather, often determines whether our view of heaven is bright or dark. Try as I may, I can never feel as cheerful upon a cloudy day as when the sun shines upon the earth. Dr. Alexander, an eminent theological teacher at Princeton, who was depressed by the raw ocean air, when once asked by a student whether he always had a full assurance of faith, replied, "Yes, except when the wind blows from the east."

Defective views of the atoning work of Christ be-

cloud our vision of heaven. Cherished sin, or idleness in the Master's service, causes us to doubt. We must watch out for all these depressing causes. I don't believe in thrashing one boy for what another has done, neither do I believe in *pommeling the soul* because of doubts, when often our frail bodies or the "spring fever" or our stubborn wills or our perverse natures are to blame. Let us at all times keep our assurance of sonship bright and clear. If my observation is worth anything, assurance makes the holiest Christians, the happiest Christians, the most active Christians, the firmest Christians. Let us pray God that *that* assurance may be ours.

I want to add just a few words concerning a single sentence toward the close of the above. The sentence is this: "Cherished sin, or idleness in the Master's service, causes us to doubt." My experience would indicate that *cherished sin* is the cause of more doubts than any thing else in this world. One who allows his inclinations to persuade him to do that which he knows is wrong, can never enjoy the peace that Christ gives, and can never feel satisfied with his Christian experience. A man signs the pledge, and stands up publicly before his fellow-men, and promises, God helping him, to break away from the sinful habit. As time passes, the old appetite asserts itself so strongly that he turns from his Savior and listens to Satan while he intimates that perhaps it is not well to break off all of a sudden, or something like that. Then he takes just a little, and then tries to hold up his head before Christian people, and to make the world believe that he is enjoying the peace that Christian people ought to enjoy. Poor, foolish, sinful man! He may deceive his fellow-men, but he can not deceive God. It is of no use for him to pray, for we are told in God's holy word—

If I regard iniquity in my heart, the Lord will not hear me.—PSALM 66:18.

Of course, there is no *if* about it in such a case, for the sinning one knows he is not a Christian. In the same way, one loses his faith in the Savior by just a little dallying with sin, or a little departure from the narrow and straight path of duty. One quickly loses his peace of mind to a certain extent, and opens the way for doubts and unbelief, by simply letting his mind dwell on the forbidden thing. Probably we are all of beset by temptations, more or less; but if we wish to have a bright, clear faith in the Lord Jesus, it behooves us to bestir ourselves when temptation comes, and to turn our backs at once, with the prayer I have so often told you about, "Lord, help," at the same time keep saying, "Get thee behind me, Satan." The sin of idleness will also bring these very doubts, as I know by personal experience. The true Christian has too many responsibilities pressing on him to waste a moment. May the Lord bless these words to every reader of GLEANINGS who has speculated within his own heart as to whether or not he is a Christian. When I am busy, and when I am cherishing no thoughts of sin in any shape or form, then is my faith brightest, and at such times I am always ready to say, with faith and happi-

ness, the words that I started out with, "I know that my Redeemer liveth."

GLEANINGS IN BEE CULTURE.

Published Semi-Monthly.

A. I. ROOT,
EDITOR AND PUBLISHER,
MEDINA, OHIO.

TERMS: \$1.00 PER YEAR, POST-PAID.

For Clubbing Rates, See First Page of Reading Matter.

MEDINA, MAY 15, 1889.

Not to be ministered unto, but to minister.—MARK 10:45.

In another column will be found some testimonials in favor of the new Dovetailed hive and its combinations. Not one word of complaint has yet been received from our customers so far.

GLEANINGS ENLARGED.

You will notice that not only the last issue, but the present one, has been enlarged to 52 pages, or 16 pages larger than usual. With the great lot of good matter awaiting insertion, we felt obliged to enlarge GLEANINGS, at least temporarily. What troubles us now is that, even with its present enlargement, there is still a great deal of valuable matter still unused; and, worse still, it may never be used. As we have said before, it is not always the best matter that finds its way into GLEANINGS print. We have on hand several communications in type, and one or two have been waiting for a considerable time in this shape.

QUEEN-REARING IN FULL COLONIES ALREADY HAVING A REIGNING QUEEN.

The *American Apiculturist* for May contains a supplement of 8 pages, the special feature of which is the rearing of queens in full colonies, without depriving the bees of their queen. This result is accomplished by inducing the swarming impulse artificially. It is a well-known fact, that bees will rear cells when possessed of a reigning queen, during the swarming season. In order to make them build cells at other times, friend Alley produces the result artificially by feeding, and bringing the colony into a condition of unusual prosperity. It rather strikes us that the process would be more work than depriving the colony of the queen; but possibly he secures better queens. For full particulars, you are referred to H. Alley, Wenham, Mass.

A CAUTION TO MAMMAS AND PAPAS.

I THINK the following deserves a place as a warning:

Our little four-year-old boy, Harry Huber (named after your own little boy and the blind naturalist), had gone with his mother, sister, and two older brothers, on a visit to "grandpa's" April 4th. The boys had gone down on the hillside, not far from the house, to play and hunt rabbits as they said. The woods had been burned the night before; and in playing around an old log that was still burning, Harry's dress caught fire and burned off before help could reach him. I was summoned by telegraph; but when I arrived his spirit had departed, and the bright blue eyes and rosy cheeks of my little bee-keeper were parched and charred in death. S. S. LAWING.
Henderson, Mo., May 9, 1889.

May the Lord sustain you and your poor afflicted wife, friend L. Perhaps it is not possible to avoid such accidents entirely; but it is well for parents

to bear in mind, when the children are playing out of sight, where there may be fire about, that such things are happening every little while. It seems a terrible thing indeed for such a little one, who did not know what to do, or the danger he was in to suffer in that way. Our children are very fond of playing with fire; and their mamma frequently allows them to do so when they have on woolen clothing that can not very readily burn, and are located where there is nothing to take fire; but even then she keeps a careful eye over them. May be your warning may save the loved ones in some other household, dear friends; and we hope and trust that you are looking to the only solid Rock that can give comfort and consolation during a trial like this.

ENCOURAGING FOR CALIFORNIA.

THE following has come to hand from a large commission house in San Diego, Cal. They say:

We estimate the honey crop of San Diego County this year at from one and a half to two million pounds, provided every thing remains as favorable through the rest of the season as it has been up to the present time. LACEY, BAILHACHE & Co. San Diego, Cal., May 7, 1889.

HONEY STATISTICS FOR JUNE 1ST.

SOME inquiries have come in, asking whether we are going to stop our department of Honey Statistics. Not a bit of it. Blanks have already been sent out, and the statistical reports will be published in our issue for June 1. So far the prospects indicated by the reports are very flattering, and success in wintering has been exceptionally good. We hope that this will jog the memory of those who have so far failed to send in their blanks filled out.

THE WESTERN APIARIAN.

THE above is the title of a new 20-page monthly bee-journal, to enter upon its apicultural career June 1. The size of the pages is to be 6 x 9, and the price is to be 50 cts. per annum. The publishers, Watkins & McCallum, of Placerville, Cal., think that an appropriate time has arrived for the publication of a magazine devoted to bee culture in the Pacific and Western States. As California is the greatest bee-country in the world, it doubtless will be represented by a good live bee-journal. We wish it success.

DOOLITTLE ON QUEEN-REARING.

A NEAT little work of 160 pages, bearing the above title, fresh from the publishers' hands, Messrs. T. G. Newman & Son, has just come to hand. The work is well printed, and, as usual, comes up to the standard of Messrs. Newmans' publications. In chapter 3, friend Doolittle discusses nature's ways versus man's ways. We must confess we fail to see wherein the author proves that the swarming queens are better than queens produced by a skilled breeder, when the cells are reared in full colonies. Doolittle may be right; but when "artificial" queens, as he would call them, will give from three to four years of good service, keeping a colony populous and well supplied with brood, we can hardly see what more can be desired. Doolittle says that, when bees are not tampered with by man, they produce queens by only one of two ways; namely, queens produced under the swarming impulse, and queens produced when bees supersede their queen naturally—the old queen having served her best days; but friend Doolittle deviates considerably from nature when he makes artificial cells, fills them with royal jelly, and final-

ly deposits therein an egg or larva. We do not deny but that first-class queens and good queens can be produced in this way; but is it altogether in accordance with nature's way?

Do we not sometimes make a mistake when, in speaking of "nature's way," we leave out of our calculations the human mind? True, no co-operation of the human mind with nature could produce a better snowflake or sunbeam than we get directly from above; but can not the human mind produce more marvelous results with the sunbeam than were ever produced by natural laws without human aid?

Allusion is made above to Doolittle's artificial cells. Chapter 7 (around which all the rest seem to center) discusses the new method of rearing queens, and how these cells may be made artificial. On page 50 is a nice engraving representing a lamp, above which is a small tin vat for holding melted wax. Beside the lamp is a cup of water. Three little sticks of wood (old rake teeth), are lying upon a little block of wood. These teeth are taken from a common hay-rake, the teeth being whittled and sandpapered so as to be as near the shape of the inside of the queen-cell as possible. Three of these sticks are dipped successively into a little of the melted wax, above the lamp. The film is cooled in the cup of water, and is then dipped again. The operation is repeated a number of times until the cell of wax has the proper thickness, when it is slipped off from the end of the rake-tooth, and more cells are made in like manner. After a sufficient number have been made, the end of the cell, or the end opposite from which the queen hatches, is stuck on to a little strip of wood by means of melted wax. After a dozen cells are fixed, this strip of wood is fastened horizontally into an old comb, the space below the strip being cut out so as to allow plenty of room for the cells. On page 56 is a nice engraving showing the cells when fully capped over by the bees. For full particulars, as also a discussion of many important matters connected with queen-rearing, we will refer you to the work itself. The book is full of valuable hints, and will be worth all it costs to any queen-breeder. Price \$1.00 by mail; 6 cents less if sent with other goods by express or freight. It can be sent from this office.

SPECIAL NOTICES.

SWEET-POTATO PLANTS.

Our sweet-potato bed has turned out so much better than we expected, that, aside from supplying our local demand, we shall have several thousand to send off by mail or express. Prices will be the same as our cabbage and celery plants; namely, 5 cts. for 10; 40 cts. for 100, or \$3.00 per 1000. If wanted by mail, add 5 cts. additional for 10 plants, or 25 cts. for 100. For list of all the plants and strawberries we now have ready for shipment, send for our seed and plant catalogue for May.

GERMAN-SILVER THIMBLES.

Perhaps many of you have noticed the very high praise we give our five-cent German-silver thimble in our price list. Well, when I was away in California our clerks got out of certain sizes, and lost the record of where they were to be purchased. But to keep business going they bought some of somebody else that looked a good deal nicer, until—the wash wore off! As a consequence quite a few of our good friends have received brass thimbles, when they paid for and had a right to expect an extra-nice German-silver one. Some of the clerks suggested that it was only a "five-cent deal, any

way;" but I tell you, a five-cent deal ought to be as straight and square as a deal of \$5000. Yes, they had worse work than selling brass for German silver. Our "boss of the counter store" (Eliza as we called her) went and got married last fall; and after that, things got sort o' mixed, and one or two, at least, got brass thimbles in place of coin silver. By way of apology for the blunder, it was urged that the brass ones, when *brand new*, were really handsomer than the silver ones. There is one thing that pleases me, however, in the above: Not one of the friends, so far as I can remember, accused us of purposely sending out a brass thimble; at least, all have been polite enough to suggest that somebody had made a blunder somewhere, when the outside came to be worn off. Well, what I wanted to say is, that we have got a splendid stock of all sorts and sizes, closed end and open end, even the big ones, of genuine first-class German silver, the very best that can be found, and they are only 5 cents apiece. If wanted by mail, add 2 cts. extra for postage and packing.

KIND WORDS FROM OUR CUSTOMERS.

Smokers received. I like the large blast-tube very much. J. GREGG.
Visalia, Cal., May 7, 1889.

The 10 Dovetailed hives that I ordered of you are at hand. I have put a part of them together. I am pleased with them. R. BOSTWICK.
Redding, Cal., April 19, 1889.

THE DOVETAILED HIVE LONG WANTED.

I am more than pleased with the Dovetailed hive. It is the hive I long have wanted, and in the future I shall use only that. F. P. STRAGER.
Bremen, O., Apr. 8, 1889.

THE DOVETAILED HIVE EASY TO PUT TOGETHER.

The Dovetailed hives came to-day. They are so simple I can put them together easily, although I am not a carpenter. Your new A B C book is splendid. B. J. THOMPSON.
Waverly, Wis., Apr. 26, 1889.

COULD NOT BETTER THE DOVETAILED HIVE.

I think you could not better the Dovetailed hive, especially the surplus arrangement, which will save much time and labor in handling and cleaning boxes. The lawn-mower is a first-class machine; it does excellent work, and much cheaper than I could have purchased one here for. O. S. ROGERS.
Brink Hill, Pa., May 13, 1889.

WHAT C. C. MILLER SAYS OF THE WORKMANSHIP OF THE DOVETAILED HIVE.

I have received and carefully inspected the Dovetailed hive; and if it is a fair specimen of the work you will send out, then the Dovetailed hive is a real acquisition. It does me good, just to look at it—so close and exact—no chance to get together any way but the right way. C. C. MILLER.
Marengo, Ill., May 1, 1889.

THE DOVETAILED HIVE THE NEAREST TO PERFECTION; A SUGGESTION.

Eureka! The Dovetailed hive is the nearest to perfection you have struck, including fixtures. Now make the brood apartment the same size as section cases, with open-top section-holders, and you will have every part the same size, and interchangeable. Bees work as well and winter better in a double brood-chamber than in a single chamber with solid comb full depth. The passageway of $\frac{3}{8}$ inch in the middle of the brood-nest is apparently just what the colony needs to shift about without going around outside. My bees came out stronger and better in spring in double brood-chambers than in single, wintered chaff packed out of doors. The double brood-chamber makes a large hive to breed up in in the spring, and can be retained its full size if large brood hives are preferred. Try the *Uniform* hive, and I am sure you will find it more simple than the *Simplicity*, and better than the best. E. E. EWING.
Rising Sun, Md.

The hive material and other goods came in nice order. I was never better pleased with hive material. Mrs. W. says that the tinware and the molding-board beat any thing she ever knew of for the money. J. C. WHEELER.
Plano, Ill., Apr. 29, 1889.

We think the carpet-sweeper very nice. My wife says she is almost sorry (not quite) that we got it; for now when she is sewing she will have no excuse for leaving little bits of clippings around on the carpet, they are so easily picked up with the sweeper. JOHN LANGLEY.
Widnoon, Pa., April 25, 1889.

The Waterbury watch you sent in place of the one I told you would not run, I received. I would have sent back the first one; but since I wrote it runs all right. I have two now, and both run very well. I don't know which one to send back, and so I think I will keep both of them. C. HOFMANN.
Harrisburg, Ark.

Brother Root:—I call you brother, as I am trying to serve the same Lord and Master. I can not tell you how much your sermons have helped me the past year, and I hope and pray that you may be spared to continue doing good. L. L. HOWE.
Harrisville, N. H.

Friend Root:—I most heartily agree with you in your concluding sentence in "Myself and Neighbors," for April 15th. May your God-inspired papers be instrumental in bringing hundreds—yes, thousands—to God's heavenly throne, in my earnest and prayerful wish. W. M. BARNUM.
Angelica, N. Y., April 23, 1889.

About five years ago I saw one of your advertisements in some paper I now forget, which induced me to raise bees, and to this day I have had no reason to regret the step, not only on account of the bees that afford me pleasure as well as profit, but principally because I was induced to have dealings with a man strictly honest, who wishes to be measured to by the same measure he gives to others. I would not hesitate to pay \$1.00 out of my pocket for GLEANINGS, when I sometimes read one article worth the price. I always read GLEANINGS from first to last, though I take five other papers, and have my hands full besides. W. W. JONES.
Hubbardston, Vt., April 21, 1889.

GOD'S WORK AND MAN'S WORK.

That 28 cents my due, you may apply on my renewal, if you please. I had forgotten it. Now, brother Root, I believe God made you an honest man, and I will tell you when I think he did it. I think somewhere about 43 years ago. H. M. BROWN.
Mulliken, Mich., Feb. 13, 1889.

[Friend B., God made us all honest. There is certainly no fault on his part. The dishonesty comes because we resist not, but give way to selfish impulses. I was vividly reminded of this yesterday when mamma had a long pull with our six-year-old Huber. He did not want to go to church nor to Sunday-school. Mamma pulled him through, however, and after Sunday-school was over he came up to me saying, "Papa, I am awful glad I was a good boy, and went to Sunday-school. I feel ever so much better now."]

WHAT AN ADVERTISEMENT IN GLEANINGS WILL DO SOMETIMES.

I just got myself in business when I put that advertisement in GLEANINGS. Letters come from all directions. Some come personally to see me, and I think I shall have no trouble in finding the right man; and, by the way, they were nearly all Christians, and temperate, and anti-tobacco. Bro. Root, I think your readers are the best crowd I ever came across. I see now how much I have missed by dropping out of their company. GEO. M. KELLOGG.
Pleasant Hill, Mo., March 13, 1889.

[Thanks for the compliment you pay us all, friend K. I have sometimes wondered if it were not true that godly and temperate people were rallying around GLEANINGS. If so, then we, perhaps, in our separate neighborhoods, may be the means of influencing a good many, who are standing undecided by the way, to turn the scale in the right direction.]

FRIEND JONES'S IGNOTUM TOMATO SEEDS, AND HIS MISHAP.

I received those tomato seeds (Ignotum), planted them in a large pan, and about 20 came up and were growing nicely. I set the pan in the sun on the banister of the porch; after a while, along came a Brown Leghorn hen and concluded to make an examination, and the result was she upset the pan and left me floundering with blasted hopes. Now, you see I am like the calculating milkmaid—visions of delicious tomatoes sliced in vinegar made my mouth water; but now—*mirabile dictu!* I am undone.

Sonora, O., April 15th, 1889.

[Friend J., here is another paper; and as the Ignotum ripens quite early—at least a part of them—I think you may have some tomatoes sliced in vinegar after all, and from your own vines.]

ADVERTISING IN GLEANINGS.

My bees wintered well; I lost 3 colonies out of 75; some, however, were not very strong; and as I work chiefly for comb honey I concluded to unite until I had disposed of my mismatched queens (as I wish to have none but purely mated). Thinking it more prudent to sell cheap than to kill them, I had an advertisement inserted in Apr. 1st GLEANINGS. To my surprise, orders came in so rapidly that I could not half fill them all. I knew not what to do but to refund the money. I feel sorry about it, knowing that many of the friends were anxiously awaiting their queen, when, lo! their letter comes in her place. If any who ordered a queen of me did not receive her or the money in her stead, they will please let me know, and I will correct all mistakes. Some had written their address so poorly that I am not sure that I addressed them correctly each time. I make it a rule to fill an order for a queen as soon as I receive it, but as I live a distance from the postoffice I do not get my mail daily; so those who must have a queen "at once" had better not order of me.

Nappanee, Ind.

THE SIMPLICITY NOT SIMPLE AFTER ALL.

We have built the largest tunnels on the Cincinnati Southern Railway; have run sawmill after sawmill, cleaned clocks, watches, etc., too numerous to mention, and were always successful; and now in old age we must admit that a Simplicity bee-hive is too much for us; therefore find inclosed \$3.00, for which send me a No. 5 two-story Simp. hive complete, put up, ready for use, to use as a pattern to enable us to use the stuff on hand. I also inclose 70 cts. for two iron gauge-frames, for hive-making. Please send an *exact* copy of those you shipped us, ready for the bees, inside and out. We are greenhorns in the business, therefore please excuse our apparent ignorance. We can't help it. God made us just that way.

Robbins, Tenn.

MRS. E. B. ROBBINS.

[Why, my good friend, do women build tunnels and sawmills, and clean clocks and watches, down your way? or do you mean that you and your good husband are so emphatically one that whatsoever work he is engaged in you know all about? That is just the sort of union that I believe in. I think, however, you will smile when you see a Simplicity hive made up, and see how extremely simple it is.]

OUR GARDEN-SEEDS, ETC.

The seeds came duly to hand, but what packets! eight or ten times as much as we get in the store. I never knew seeds to come so quickly. The beets were up in nine days. I got some of _____'s seeds. A packet of early cabbage proved to be four or five different sorts. All came up badly, some not at all. I am sorry to say that the birds took all my white lettuce, my first sowing of Grand Rapids lettuce, all my Ignotum tomatoes but three, and several plantings of beets. They came on to the window-sill to get them. They take every thing as fast as it comes up.

The particulars of your journey to California were very interesting. I worked on the bridges, etc., along those rock cuts on the Rio Grande. I wish I had known, when you were going through San Antonio. I should have been pleased to meet you.

Lytle, Texas, April 4, 1889.

GEO. E. HAYLES.

[Several have made mention of the large amount of seeds we give for 5 cents. We try to put them

up in the way the shoemaker charged for mending my boot. We charge about what we should like to have other folks charge us. We are pretty sure that our seeds will all grow, because we are constantly planting them—yes, a great many of them, every month in the year, and we think they are pretty true to name.]

NON-SWARMERS.

I have a nice lot of these fine queens now for \$1.00 each. Safe arrival guaranteed; also satisfaction given in size and color. With me the old queen and her progeny positively refuse to swarm under the most favorable circumstances.

10d **R. B. WILLIAMS,**
Winchester, Franklin Co., Tenn.

In responding to this advertisement mention GLEANINGS.

1000 LBS. OF ITALIAN BEES FOR SALE AT 75 CENTS PER LB.
Three-frame nuclei, with tested Italian queen, \$3.00 each. Tested Italian queens, \$1 each. Untested, 75 cts. each or three for \$2.
10tfdb **I. R. GOOD, Nappanee, Ind.**

LOOK HERE!

STRONG THREE-FRAME NUCLEI, WITH QUEEN FROM IMPORTED ITALIAN MOTHER, FOR \$2.50.

Safe arrival and satisfaction guaranteed.

Address G. W. GILLET, WELLINGTON, OHIO,
10-11-12d or M. W. SHEPHERD, ROCHESTER, OHIO.

In responding to this advertisement mention GLEANINGS.

Gift! Gift! Gift!

To every purchaser of one tested yellow Italian queen, in June and after, for \$1.50, I will give one L. frame nucleus, 50 cts., for each added frame of brood and bees. Tested queens, \$1.25; untested, \$1.00. Send for price list.

MRS. OLIVER COLE,
Sherburne, Chen. Co., N. Y.
Chenango Valley Apiary. 10tfdb

In responding to this advertisement mention GLEANINGS.

LEARN TO WRITE YOUR OWN NAME WELL by sending 20 cts. to F. A. WOOTTON, Penman, Skilesville, Ky., for 12 beautiful cards with your name finely written in different combinations. Various styles of cards, alphabets, etc., fresh from the pen. *Best references.* 10-11d

100 COLONIES OF ITALIAN and HYBRID BEES FOR SALE

All strong and healthy; also Japanese buckwheat. Write for our low prices.

A. J. & E. HATFIELD, South Bend, Ind.

THE A B C OF

CARP CULTURE

A COMPLETE TREATISE

Upon the Food Carp and its Culture.

INCLUDING PLANS AND SPECIFICATIONS, AND FULLEST INSTRUCTIONS FOR THE CONSTRUCTION OF PONDS, AND EVERY THING PERTAINING TO THE BUSINESS OF RAISING CARP FOR FOOD.

Illustrated by Many Fine Engravings.

By A. I. Root and George Finley.

PRICE: 35 Cts.; by Mail, 40 Cts.,

A. I. ROOT, Medina, O.

Wants or Exchange Department.

Notices will be inserted under this head at one-half our usual rates. All ads intended for this department must not exceed 5 lines, and you must say you want your ad. In this department, or we will not be responsible for any error. You can have the notice as many lines as you please; but all over five lines will cost you according to our regular rates. This department is intended only for bona-fide exchanges. Exchanges for cash or for price lists or notices offering articles for sale can not be inserted under this head. For such our regular rates of 20 cts. a line will be charged, and they will be put with the regular advertisements.

WANTED.—To exchange 250 colonies of bees, for horses, mules, wagons, buggies, and 4 h. p. engine, or any thing useful on a plantation.
21tfdb ANTHONY OPP, Helena, Phillips Co., Ark.

WANTED.—To sell or exchange, Italian bees and queens, and supplies. Address
OTTO KLEINOW,
41tfdb No. 150 Military Ave., Detroit, Mich.

WANTED.—To exchange a magic lantern, 12 views, cost \$12, for a watch. 9-10d
E. B. HUGHES, Pipestem, Summers Co., W. Va.

WANTED.—To exchange Japanese buckwheat and P. Rock eggs, and Barnes improved circular saw, for bees by the pound, young queens, and reliable strawberry plants. H. O. MCELHANY,
9-12db Cedar Rapids, Ia

WANTED.—To exchange 400 brood-combs in L. frames, and 300 combs in half L. frames (half depth), valued at 10 cts. each.
9d MISS DELLY REYNOLDS, Sonora, Ky.

WANTED.—To exchange farm stock, and tools, or trade, for Southern or Western property.
10d OSCAR W. JEFFERSON,
Acme, Grand Traverse Co., Mich.

WANTED.—To exchange untested Italian queens, reared from select queens, under swarming impulse, for Wyandotte or Golden Pheasant eggs.
10d G. F. TYLER, Honey Grove, Tex.

WANTED.—To exchange my price list of Italian bees and queens for your address on a postal card.
10tfdb R. W. TURNER,
Medina, Ohio.

WANTED.—To exchange bright yellow Italian queens for comb foundation. For further particulars address
10d JAMES F. WOOD,
North Prescott, Mass.

WANTED.—To exchange V-groove sections for empty combs. J. B. MURRAY, Ada, Hard. Co., O.

WANTED.—To sell or exchange 25 L. hives, 10 frame, with good combs; only 20 have top-story: 1200 sections in flat; 50 T supers, for cash, honey, or best offer inside 30 days. E. A. EASTMAN,
10d Birnamwood, Shawano Co., Wis.

WANTED.—To exchange one single barrel breech-loading shot-gun, 12 bore, hammerless, cost new, \$14 00; 200 brood-frames in flat, all wood, 30 T supers in flat, one solar wax extractor, one 96 in. roll perforated zinc, 10 zinc honey-boards, for offers of bees by the pound, with and without queens, or any thing useful.
10tfdb C. L. HILL, Dennison, Tusc. Co., Ohio.

Black and Hybrid Queens For Sale.

About one dozen black and hybrid queens for sale, at 30 cts. apiece. E. R. MILLER,
Garden City, Cass Co., Mo.

FOR SALE.—Another lot of those hybrid queens, one year old, good layers, at 50 cts. each, in Peet cages, at sender's risk.
H. L. FISHER, Milford, Kosciusko Co., Ind.

**TESTED ITALIAN QUEENS, \$2.00.
UNTESTED, AFTER JUNE 1, \$1.00.
PRICE LIST FREE. R. W. TURNER, Medina, O.**

Price of Sections Reduced.

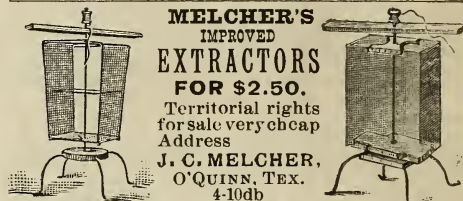
I will sell No. 1 white basswood V-groove sections at \$3 00 per M. No. 2, \$2 00 per M. Price list free.

J. M. KINZIE,
10-14db Rochester, Oakland Co., Mich.
In responding to this advertisement mention GLEANINGS.

FOR SALE CHEAP.

200 LANGSTROTH and SIMPLICITY HIVES, some new and in the flat; a lot of empty comb, a Novice extractor, and other bee-fixtures, which I will sell cheap. Write for particulars. Reasons for selling, I am out of the business.
10d W. J. FRANCISCO, Marshall, Mich.
In responding to this advertisement mention GLEANINGS.

A NEW BOOK ON BEES, and DADANT'S FOUNDATION.
See advertisement in another column.



In responding to this advertisement mention GLEANINGS.

JAPANESE * BUCKWHEAT.



At the present time, the new Japanese buckwheat is by all odds further in advance than all other kinds. This is the third season that it has been before the public; and the reports to the agricultural press and bee-journals place it far ahead of the silverhull, gray, or common. The grain is larger in size, and it gives a very much larger yield of grain. It is fully equal in quality of flour to any of our old kinds, and very much ahead of them in quantity. The reports for honey are somewhat conflicting, but I believe it yields fully as much honey as any other buckwheat known. The price of the Japanese is as follows: Per bushel, \$2 00; 1/2 bush, \$1.25; per peck, 75c; 1 lb., 10c. If wanted by mail, add 9c for postage. In lots of 5 bushels or more, \$1.75 per bush. Our seed is going rapidly. Would advise you to order early before we are sold out. See reports in another part of this issue.

A. I. ROOT, Medina, Ohio.

UNTIL FURTHER NOTICE.

Select tested Italian queens, \$1.00. Standard breeding queens, \$2.00. Imported, fine and prolific, \$6.00.

R. H. CAMPBELL,
Madison, Morgan Co., Ga.

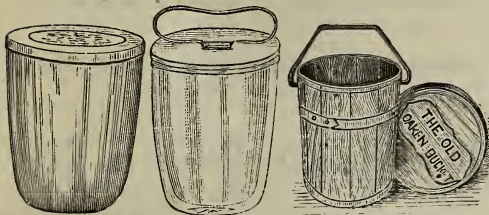
In responding to this advertisement mention GLEANINGS.

5 LBS. of bees, in one lot, \$4.00; 4 lbs., \$3.25. Add price of queen, if one is wanted. See ad. in this number.
MISS A. M. TAYLOR,
10d Box 77. Mulberry Grove, Bond Co., Ill.

QUEENS BY RETURN MAIL.

Tested Queens, \$1.25; - Untested, \$1.00.
10tdb I. GOOD, SPARTA, WHITE CO., TENNESSEE.

Glass Honey Tumblers and Pails.



Glass Tumbler. Nos. 788 and 789. Screw-top Pail. Nos. 775 to 778. Oaken Bucket Pail.

Above we present our three staple styles of glass honey-packages for this season. We are unable to get any more of the screw-top glass pails, shown in our catalogue, such as we have been selling for a number of years, and we have substituted in its place the one shown in the center above. We have this made specially for our trade, and no one else handles it. The following revised table of prices takes the place of those in our catalogue. Please notice important changes, and please be careful to be specific in telling what you want when you order. Give the quantity, number, name, and price, to avoid mistakes.

TABLE OF PRICES—NO CHARGE FOR PACKAGES.
Please order by number and name, and give price.

Number and Name.	Capacity.—Price.—Barrels.			
	Qty.	Ea.	10.	100 No. Pr.
No. 778, ½-lb. tumbler.....	10 oz.	3	28	250 \$5.30
No. 789, one-pound tumbler.....	16 oz.	3	30	3.00 200 5.20
Nos. 788 and 789, nested.....		6	57	5.25 200 9.00
No. 775, ½-lb. screw-top glass pail.....	11 oz.	5	40	3.50 250 7.30
No. 776, small pound screw-top pail.....	14 oz.	5	42	3.75 200 6.60
No. 777, large pound screw-top pail.....	17 oz.	6	52	4.75 150 6.60
No. 778, 1½-lb. screw-top glass pail.....	24 oz.	7	65	6.00 100 6.00
½-lb. Oaken Bucket pail.....	10 oz.	5	42	3.75 200 6.60
1-lb. Oaken Bucket pail.....	16 oz.	5	45	4.30 150 6.10

In lot of 5 barrels, any one or assorted kinds, 5% discount. Please notice these points in the table above.

1. The capacity as given is what each will hold, well filled with honey of good consistency.

2. The price of one, 10, and 100 is given in the first three columns; the fourth column gives the number in a barrel, and the 5th column the price of a barrel.

3. Notice that it is much the most economical to buy them in barrel lots, if you can use so many. The reason for this is, that all manufactures of glassware have a uniform charge for packages, and a barrel has the largest capacity for the price of any thing used. Every barrel, large or small, costs us 35 cts; a box, holding only half as much, costs the same. Thus by taking the largest barrels, well filled, we can give you the most value for the money.

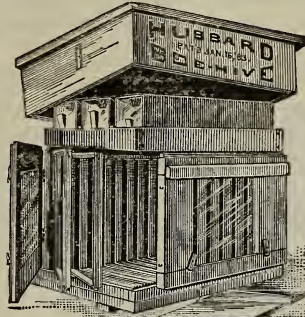
4. We can not break packages of 100 or barrels at the price of a full package.

5. The most skilled packers are employed, and goods are delivered to transportation companies in good order; we will not, therefore, be responsible for any breakage.

Send your orders early, while we have plenty of stock and can maintain above prices.

A. I. ROOT, Medina, O.

FORT WAYNE, IND.



CIRCULARS FREE.
ASK FOR SAMPLE ONE-PIECE SECTION IF YOU WANT IT.

G. K. HUBBARD,
277 S. HARRISON ST.,
FT. WAYNE, IND.

If you are ever annoyed by the scraping and breaking of combs; killing bees when setting a frame to one side, or hanging it in the hive; sagging at the bottom and getting waxed fast; shaking about when moving a hive; in short, if you dislike to pry and wrench your frames, break combs, and kill bees while handling them, you will be pleased with this hive.

VERY CONVENIENT. AGENTS WANTED.
For "1st Principles in Bee Culture." It tells how to Divide, Transfer, Introduce Queens, Feed, Unite, Stop Robbing, &c. Money returned upon return of book, if you are not satisfied.
Mention GLEANINGS. 7-12db

BEE-HIVES, SECTIONS, ETC.

WE make the best bee-hives, shipping-crates, sections, etc., in the world, and sell them cheap. We are offering our choicest white one-piece 4¼x4¼ sections, in lots of 500, at \$3.50 per 1000.

Parties wanting more, write for special prices. No. 2 sections, \$2 00 per 1000. Catalogues free, but sent only when ordered. 1tfdb

C. B. LEWIS & CO., Watertown, Wis.
In responding to this advertisement mention GLEANINGS.

HONEY, BEES, QUEENS, SUPPLIES.

Catalogue Free.
OLIVER FOSTER, MT. VERNON, IOWA. 3tfdb
In responding to this advertisement mention GLEANINGS.

DADANT'S FOUNDATION

Is kept for sale by Messrs. T. G. Newman & Son, Chicago, Ill.; C. F. Muth, Cincinnati, O.; Jas. Heddon, Dowagiac, Mich.; F. L. Dougherty, Indianapolis, Ind.; B. J. Miller & Co., Nappanee, Ind.; E. S. Armstrong, Jerseyville, Ill.; E. Kretschmer, Coburg, Iowa; P. L. Viallon, Bayou Goula, La.; M. J. Dickason, Hiawatha, Kansas; J. W. Porter, Charlottesville, Albemarle Co., Va.; E. R. Newcomb, Pleasant Valley, Dutchess Co., N. Y.; D. A. Fuller, Cherry Valley, Ill.; J. B. Mason & Sons, Mechanic Falls, Maine; G. L. Tinker, New Philadelphia, O.; Jos. Nysewander, Des Moines, Ia.; C. H. Green, Waukesha, Wis.; G. B. Lewis & Co., Watertown, Wisconsin; J. Mattoon, Atwater, Ohio; Oliver Foster, Mt. Vernon, Iowa; C. Hertel, Freeburg, Illinois; Geo. E. Hilton, Fremont, Mich.; J. M. Clark & Co., 1409 15th St., Denver, Colo.; Goodell & Woodworth, Mfg. Co., Rock Falls, Ill.; J. A. Roberts, Edgar, Neb.; E. L. Good & Co., Brantford, Ontario, Canada; J. N. Heater, Columbus, Neb.; E. C. Eaglesfield, Berlin, Wis.; C. D. Batten, Peterboro, Mad. Co., N. Y.; G. K. Hubbard, Fort Wayne, Ind., and numerous other dealers.

We guarantee every inch of our foundation equal to sample in every respect. Every one who buys it is pleased with it.

Write for free samples, and price list of bee-supplies and specimen pages of the new

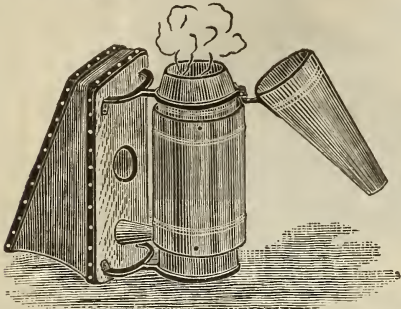
REVISED LANGSTROTH BOOK,

Edition of 1889. 3tfdb
CHAS. DADANT & SON,
Hamilton, Hancock Co., Illinois.

In responding to this advertisement mention GLEANINGS.

1889. HELLO! HELLO! 1889.

How are supplies selling? You send for W. E. CLARK'S illustrated price list. He is rock bottom for all supplies, and don't you forget it.



W. E. Clark's Improved Hinge-Nozzle Quincy Smoker. The Best Smoker Made.

Oriskany, - Oneida Co., - New York
3-14db *Mention Gleanings.*

Minnesota Ahead!

We are selling L. hives with T supers for 55c., and brood-frames for \$1.00 per hundred. Send for circular before ordering elsewhere. 7-10db
W. H. BRIGHT, Mazeppa, Minn.

VIRGIN QUEENS.

The bulk of the traffic in queens in the near future will probably be in "Virgins." Every person sending direct to the office of the *Canadian Bee Journal* one dollar for one year's subscription (either renewal or new), in advance, will receive a beautiful virgin queen (value 60 cents), as soon as possible, in the season of 1889. Queens will be sent in the same rotation as each is received. American currency, stamps, and money orders received at par. **THE D. A. JONES CO., BEETON, ONTARIO, CAN.**
i *In responding to this advertisement mention GLEANINGS.*

ITALIAN QUEENS.

Tested, \$2.00, \$1.50, and \$1.25, in Apr., May and June. One untested, May, \$1.00; after June 1st, .75. Three untested, May, \$2.50; after June 1st, \$2.00. Three-frame nuclei, with untested queen, May, \$3.50; June, \$3.00; after, \$2.60; with tested queen, add 50 cts. For prices of 2-frame nuclei bees, per lb. and 1/2 lb., full colonies, foundation, and bee-keepers' supplies, write for price list. Address 6-11db **JNO. NEBEL & SON, High Hill, Mo.**
In responding to this advertisement mention GLEANINGS.

No. 1, \$2.00; No. 2, \$1.75; No. 3, \$1.50 | Knife, No. 4, 1.25; No. 5, 1.00; No. 6, .65 | \$1.15

On receipt of the above price

SMOKERS and KNIVES

will be sent postpaid. Descriptive circulars will be sent on receipt of request card.



Bingham & Hetherington Smokers and Knives are staple tools, and have been used ten years without complaint, and are the only stovewood-burning clear-smoke bee-smokers; no going out, no vexation. Address

BINGHAM & HETHERINGTON, ABRONIA, MICH.

Please mention GLEANINGS.

6tfdb

SECTIONS and FOUNDATION CHEAPER THAN EVER.

Sections Only \$3. Dealers write for special prices. Free samples and price list. 1-12db
(Near Detroit.) **M. H. HUNT, BELL BRANCH, MICH.**
In responding to this advertisement mention GLEANINGS.

EARLY Untested Italian Queens, 75c. each.
stfdb **YOUNG G. LEE, Charlotte Harbor, Fla.**

Apr. 1. For 60 Days. 1889.

We have on hand a large stock of one-piece sections, which are first class. To reduce stock we will name very low prices for the next 60 days, in any size lots from 1000 to 100,000 or more. Save money by letting us know what you want. Other supplies to correspond in price. Price list free.

7tfdb **SMITH & SMITH,**
Mention Gleanings. Kenton, Hardin Co., O.

If You Want Full value for your money you should see my catalogue before purchasing. Japanese buckwheat, \$1.75 per bushel; 20 varieties of potatoes. Bees, queens, and supplies at low rates. **CHAS. D. DUVALL,**
7tfdb Spencerville, Mont. Co., Md.

In responding to this advertisement mention GLEANINGS.

APIARIAN SUPPLIES CHEAP.

BASSWOOD V-GROOVE SECTIONS, \$2.75 to \$3.75 PER M. SHIPPING-CASES VERY LOW. SEND FOR PRICES.

COODELL & WOODWORTH MFG. CO.,
3tfdb **ROCK FALLS, ILLINOIS.**

In responding to this advertisement mention GLEANINGS.

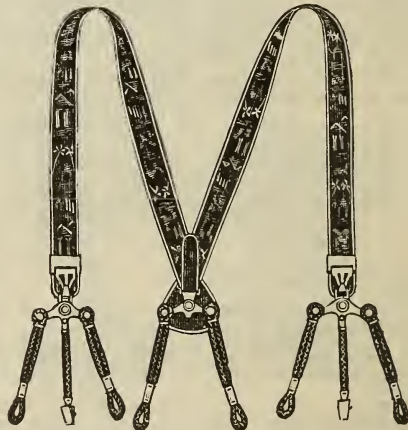
Italian Bees and Queens for Sale

Wishing to reduce my stock of bees, I offer 50 colonies of fine Italian bees at the following extremely low rates: Full strong colonies on L. frames, put up in light shipping-boxes, f. o. b. at my station, \$5.00 per colony. Tested queens, \$1.25 each. Satisfaction guaranteed.

8-11db **A. C. BRUSH,**
Susquehanna, Sus. Co., Pa.

In responding to this advertisement mention GLEANINGS.

SUSPENDERS FOR BEE-KEEPERS.



A number of customers have requested us to get a good suspender for bee-keepers, and a number of kinds have been suggested. The one shown above, called the "Foster," suits us as well as any we have seen. If you notice carefully you will see that, by the use of eveners, or equalizers, the strain on each button is the same. We can furnish them made of good white elastic web cotton ends, at 35 cts. per pair; silk ends, 50 cts. By mail, postpaid, 5 cts. per pair extra. In ordering please call them the "Foster." We can furnish very good white elastic suspenders, without the eveners, at 25 cts. per pair; by mail, 5c extra. Adjustable elastic armlets, 10c per pair, postpaid. **A. I. ROOT, MEDINA, OHIO.**

P. S.—Have just received some suspenders to sell for 10c that have never been sold before for less than 15c. Elastic web throughout; only 10c; by mail, 14c.

PURE ITALIAN QUEENS

FROM THE APIARIES OF

J. P. CALDWELL,

Of San Marcos, Tex. Reared under the most favorable circumstances. Will be sent by mail postpaid at the following prices:—

	Mar.	Apr.	May.	to Oct.
Select tested.....	\$4 00	\$3 75	\$3 25	\$2 75
Tested.....	3 00	2 75	1 75	1 50
Untested.....		1 25	1 00	1 00
6 Untested.....		5 50	5 00	4 50
12 Untested.....		9 50	9 00	8 50

Contracts taken with dealers to furnish queens by the week at special rates. Address

5-21db J. P. CALDWELL, San Marcos, Tex.
In responding to this advertisement mention GLEANINGS.

FOUND AT LAST!

How to cheaply keep eggs fresh for a year. Send for particulars. DR. A. B. MASON, 9-14db Auburndale, Ohio.

THE EASIEST WAY

TO GET YOUR CHAFF HIVES,

Is to sell a few for me to your neighbors, and make profit enough to buy your own. Write for terms at once. 3tfdb J. A. ROE, Union City, Ind.

In responding to this advertisement mention GLEANINGS.

HOLY-LAND QUEENS

A SPECIALTY.

BEEES BY THE POUND, IN A L. FRAME.

BEE-KEEPERS' SUPPLIES.

GEO. D. RAUDENBUSH, 445 CHESTNUT ST., READING, PA.
Mention GLEANINGS. 9-10-11d

WANTED!

At Plattsmouth, Nebraska, to Sell

3-Frame Nucleus Colonies Italian Bees with Queens, at \$2.50 Each.

9tfdb J. M. YOUNG, Box 874, Plattsmouth, Neb.

THE BRICHTEST FOUR-BANDED GOLDEN ITALIAN BEES AND QUEENS, AND THE REDDEST DRONES.

Price, select tested, \$3.00; tested, \$2.00. Untested, in May, \$1.25; June and after, \$1.00.

9-12db L. L. HEARN, Frenchville, W. Va.

In responding to this advertisement mention GLEANINGS.

AN OLD BEE-BOOK REVISED, and DADANT'S FOUNDATION. See advertisement in another column.



Eaton's Improved SECTION CASE. BEES AND QUEENS. Send for free catalogue. Address FRANK A. EATON, 5-16db Bluffton, Ohio.

In responding to this advertisement mention GLEANINGS.

THOROUGHbred White P. Rock, W. Wyandotte eggs, \$1.50 per 13; L. Brahma, P. Rock, L. Wyandotte, W. and B. Leghorn eggs, \$1.00 per 13. Italian Queens, reared on the Doolittle plan, select tested, in May, \$3.00; June, \$2.50. Warranted, May, \$1.25; June, \$1.00.

7-12db

C. H. WATSON, Newtown, Bucks Co., Pa.

I WILL SELL FULL COLONIES OF BEES, IN eight-frame Langstroth hives, at \$4.00 per colony, in lots of five or more.

9-10d H. C. GILSON, Burr Oak, Mich.

100 TONS OF COMB HONEY

Will undoubtedly be put on the market this season in our

FOLDING PAPER BOXES.

Send for catalogue, 20 pages, free. Sample box, 5c. Our prices defy competition.

9-20db A. O. CRAWFORD, S. WEYMOUTH, MASS.

In responding to this advertisement mention GLEANINGS.

EGGS FOR HATCHING. P. Rock, Light Brahma, R. C. B. Leghorn, P. Duck, \$1.25 per nest; two settings, \$2.00. W. P. Rock, \$1.50 per 13. Choice pure-bred stock. Circular free. S. P. YODER, E. Lewistown, Mahoning Co., Ohio.

Rearing Queens in Colonies

having laying queens. Send your address on a postal card. Circular free.

8-10d H. ALLEY, Wenham, Mass.

HOW TO MANAGE BEES;

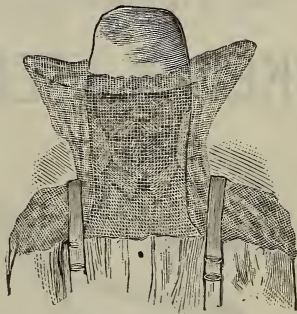
OR, BEE-KEEPING FOR THE "MASSES."

Every farmer, and all beginners in bee-keeping, as well as those more advanced, should have it, as it is especially adapted to their wants. Fully up to date. Price \$1.00, by mail. In beautiful paper covers. Illustrated. Address

8-6d W. S. VANDRUFF, Waynesburg, Pa.

In responding to this advertisement mention GLEANINGS.

BEE HAT AND VEILS.



Most people who handle bees wear some kind of a veil, or bee-hat, as some call 'em. Above we show the rig we prefer. The hat is one we have sold and recommended for two years, and have used for five or six. It is a light cloth hat, weighing only 1 oz.; fits any head, the inside rim having a rubber cord in it. The outside rim is held out in place by a spring wire.

We make veils of four different qualities.

No. 1 is our best veil, made of grenadine and silk brussels net, or tulle face.

No. 2 is the same without the tulle face, being all of grenadine.

No. 3 is made of mosquito bar, with tulle face.

No. 4 is made of mosquito bar without the tulle face.

	Price—	each.	10.	100.
No. 1. Best veil.....	\$	75	\$6 00	\$55 00
No. 2. Grenadine veil		60	4 75	45 00
No. 3. Tulle-face bar.		40	3 20	30 00
No. 4. Mosquito bar..		25	2 00	18 00
Bee-hat.....		20	1 60	15 00

Sent postpaid, or with other goods, on receipt of price. Our veils are larger and more roomy than those of other makes that we have seen. They have a rubber cord in the top, to draw them tight around the hat, as shown in cut. The lower edge is bound with a blue ribbon, and is drawn under the suspenders, as shown. The grenadine veils will wear much longer than mosquito-bar.

A. I. ROOT, Medina, Ohio.

GLEANINGS IN BEE CULTURE.

Books for Bee-Keepers and Others.

Any of these books on which postage is not given will be forwarded by mail, *postpaid*, on receipt of price.

In buying books, as every thing else, we are liable to disappointment, if we make a purchase without seeing the article. Admitting that the bookseller could read all the books he offers, as he has them for sale, it were hardly to be expected he would be the one to mention all the faults, as well as good things about a book. I very much desire that those who favor me with their patronage shall not be disappointed, and therefore I am going to try to prevent it by mentioning all the faults so far as I can, that the purchaser may know what he is getting. In the following list, books that I approve I have marked with a *, those I especially approve, **; those that are not up to times, †; books that contain but little matter for the price, large type, and much space between the lines, ‡; foreign, §.

BIBLES, HYMN-BOOKS, AND OTHER GOOD BOOKS.

- 8 | Bible, *good print*, neatly bound..... 25
 - 10 | Bunyan's Pilgrim's Progress**..... 35
 - 6 | First Steps for Little Feet. By the author of the Story of the Bible. A better book for young children can not be found in the whole round of literature, and at the same time there can hardly be found a more attractive book. Beautifully bound, and fully illustrated. Price 50c. Two copies will be sold for 75 cents. Postage six cents.
 - 5 | Harmony of the Gospels..... 35
 - 3 | John Ploughman's Talks and Pictures, by Rev. C. H. Spurgeon*..... 10
 - 1 | Gospel Hymns, consolidated Nos. 1, 2, 3 and 4, words only, cloth, 10c; paper..... 05
 - 2 | Same, board covers..... 20
 - 5 | Same, words and music, small type, board covers..... 45
 - 10 | Same, words and music, board covers..... 75
 - 3 | New Testament in pretty flexible covers..... 05
 - 5 | New Testament, new version, paper cover..... 10
 - 5 | Robinson Crusoe, paper cover..... 20
 - 15 | Story of the Bible**..... 1 00
- A large book of 700 pages, and 274 illustrations. Will be read by almost every child.
- 5 | The Christian's Secret of a Happy Life**..... 25
 - 8 | Same in cloth binding..... 50
 - 5 | "The Life of Trust," by Geo. Muller**..... 1 25
 - 1 | Ten Nights in a Bar Room, by T. S. Arthur*..... 05

BOOKS ESPECIALLY FOR BEE-KEEPERS.

As many of the bee-books are sent with other goods by freight or express, incurring no postage, we give prices separately. You will notice, that you can judge of the size of the books very well, by the amount required for postage on each.

- 12 | A B C of Bee Culture** Paper..... 88
 - 15 | A B C of Bee Culture** Cloth..... 1 10
 - 5 | A Year Among the Bees, by C. C. Miller **..... 70
 - 14 | Bees and Bee-keeping, by Frank Cheshire, England, Vol. I,**§..... 2 36
 - 21 | Same, Vol. II,**§..... 2 79
- or, \$5.25 for the two, postpaid.
- Bees and Honey, by T. G. Newman..... 1 00
 - 15 | Cook's New Manual ** Cloth..... 1 35
 - 2 | Dzierzon Theory**..... 10
 - 1 | Foul Brood; Its management and cure; D. A. Jones**..... 09
 - 1 | Honey as Food and Medicine..... 5
 - 10 | Langstroth on the Hive and Honey-Bee**† 1 40
 - 15 | Langstroth Revised, by Ch. Dadant & Son**..... 1 85
 - 10 | Quinby's New Bee-Keeping**..... 1 40
 - 10 | Queen-Rearing, by H. Alley*..... 1 00
 - 4 | Success in Bee Culture, by James Heddon*..... 46
 - The Production of Comb Honey, by W. Z. Hutchinson**..... 25

- The Apiary; or, Bees, Bee-Hives, and Bee Culture, by Geo. Neighbour & Sons, England*§..... 1 75
- British Bee-Keeper's Guide - Book, by Thos. Wm. Cowan, Esq., England*§..... 40
- 3 | Merrybanks and His Neighbor, by A. I. Root..... 25

MISCELLANEOUS HAND-BOOKS.

- 5 | A B C of Carp Culture, **..... 35
 - 3 | A B C of Potato Culture, Terry**..... 35
- This is T. B. Terry's first and most masterly work. The book has had an enormous sale, and has been reprinted in foreign languages. When we are thoroughly conversant with friend Terry's system of raising potatoes, we shall be ready to handle almost any farm crop successfully. It has 48 pages and 22 illustrations.
- 5 | An Egg-Farm, Stoddard**..... 45
 - Barn Plans and Out-Buildings*..... 1 50
 - Cranberry Culture, White's..... 1 25
 - Canary Birds; paper, 50c; cloth*..... 75
 - Draining for Profit and Health, Warring..... 1 50
 - 5 | Eclectic Manual of Phonography; Pitman's System; cloth..... 50
 - 6 | Fuller's Practical Forestry‡..... 1 40

- 10 | Farming For Boys*..... 1 15
- This is one of Joseph Harris' happiest productions, and it seems to me that I ought to make farm-life fascinating to any boy who has any sort of taste for gardening.

- 10 | Fuller's Grape Culturist**..... 1 40
- 7 | Farm, Gardening, and Seed-Growing, by Francis Brill**..... 90

This is by Francis Brill, the veteran seed-grower, and is the only book on gardening that I am aware of that tells how market-gardeners and seed-growers raise and harvest their own seeds. It has 166 pages.

- 10 | Gardening For Pleasure, Henderson*..... 1 40
- While "Gardening for Profit" is written with a view of making gardening PAY, it touches a good deal on the pleasure part; and "Gardening for Pleasure" takes up this matter of beautifying your homes and improving your grounds, without the special point in view of making money out of it. I think most of you will need this if you get "Gardening for Profit." This work has 246 pages and 134 illustrations.

- 12 | Gardening for Profit,** New Edition..... 1 85
- This is a late revision of Peter Henderson's celebrated work. Nothing that has ever before been put in print has done so much toward making market-gardening a science and a fascinating industry. Peter Henderson stands at the head, without question, although we have many other books on these rural employments. If you can get but one book, let it be the above. It has 376 pages and 138 cuts.

- 8 | Gardening for Young and Old, Harris**..... 90
- This is Joseph Harris' best and happiest effort. Although it goes over the same ground occupied by Peter Henderson, it particularly emphasizes thorough cultivation of the soil in preparing your ground; and this matter of adapting it to young people as well as to old is brought out in a most happy way. If you have any sort of fancy for gardening it will pay you to make them a present of this book. It has 187 pages and 46 engravings.

- | Gray's School and Field Book of Botany... 1 80
 - 5 | Gregory on Cabbages; paper*..... 25
 - 5 | Gregory on Squashes; paper*..... 25
 - 5 | Gregory on Onions; paper*..... 25
- The above three books, by our friend Gregory, are all valuable. The book on squashes especially is good reading for almost anybody, whether they raise squashes or not. It strikes at the very foundation of success in almost any kind of business.

- 10 | Household Conveniences..... 1 40
- 2 | How to Propagate and Grow Fruit, Greer*..... 25
- 5 | How to Make Candy**..... 45
- 10 | How to Keep Store*..... 1 00
- 10 | Irrigation for the Farm, Garden, and Orchard, Stewart*..... 1 40

This book, so far as I am informed, is almost the only work on this matter that is attracting so much interest, especially recently. Using water from springs, brooks, or windmills, to take the place of rain, during our great droughts, is the great problem before us at the present day. The book has 274 pages and 142 cuts.

- 3 | Maple Sugar and the Sugar-Bush,**..... 35
- By Prof. A. J. Cook. This was written in the spring of 1887, at my request. As the author has, perhaps, one of the finest sugar-camps in the United States, as well as being an enthusiastic lover of all farm industries, he is better fitted, perhaps, to handle the subject than any other man. The book is written in Prof. Cook's happy style, combining wholesome moral lessons with the latest and best method of managing to get the finest sugar and maple syrup, with the least possible expenditure of cash and labor. Everybody who makes sugar or molasses wants the sugar-book. It has 42 pages and 35 cuts.

- 10 | Money in The Garden, Quinn*..... 1 40
- 1 | Poultry for Pleasure and Profit**..... 10
- 11 | Practical Floriculture, Henderson*..... 1 35
- 1 | Peach Culture, Fulton's..... 1 50
- 10 | Profits in Poultry..... 90
- 2 | Purdy's Small-Fruit Instructor*..... 15
- 2 | Silk and the Silkworm..... 10
- 10 | Small-Fruit Culturist, Fuller*..... 1 40
- 3 | Strawberry Culturist, Fuller*..... 15
- 10 | Success in Market-Gardening*..... 90

This is new book by a real, live, enterprising, successful market-gardener who lives in Arlington, a suburb of Boston, Mass. Friend Rawson has been one of the foremost to make irrigation a practical success, and he now irrigates his grounds by means of a windmill and steam-engine whenever a drought threatens to injure the crops. The book has 208 pages, and is nicely illustrated with 110 engravings.

- 10 | Talks on Manures*..... 1 90
- This book, by Joseph Harris is, perhaps, the most comprehensive one we have on the subject, and the whole matter is considered by an able writer. It contains 366 pages.
- 2 | The Carpenter's Steel Square and its Uses; Hodgson; Abridged..... 15
 - 2 | Treatise on the Horse and his Diseases..... 10
 - 10 | The New Agriculture, or the Waters Led Captive..... 1 00

- 3 | Winter Care of Horses and Cattle..... 40
- This is friend Terry's second book in regard to farm matters; but it is so intimately connected with his potato-book that it reads almost like a sequel to it. If you have only a horse or a cow, I think it will pay you to invest in the book. It has 44 pages, and 4 cuts.

- 8 | What to Do, and How to be Happy While Doing It, by A. I. Root..... 50
- 3 | Wood's Common Objects of the Microscope**..... 47

Address your orders to
A. I. ROOT, Medina, Ohio

GLEANINGS IN BEE CULTURE.

✂ BEE - KEEPERS' . SUPPLIES. ✂

QUALITY AND WORKMANSHIP UNSURPASSED.

We are prepared to furnish **Bee-Keepers** with **Supplies Promptly**, and with goods of uniform excellence, as heretofore. Our Hives all take the **Simplicity Frame**. The "**Falcon**" **Chaff Hive** and the "**Chautauqua**," with **Dead-Air Spaces**, are both giving universal satisfaction.

We manufacture a **Full Line of Bee-Keepers' Supplies**, including "**Falcon**" **Brand Foundation**, and gladly

FURNISH ESTIMATES, AND SOLICIT CORRESPONDENCE.

SEND * FOR * LARGE * ILLUSTRATED * PRICE * LIST * FOR * 1889 * FREE.

THE W. T. FALCONER MANUFACTURING CO.,

Jamestown, N. Y.

Successors to **W. T. FALCONER.**

In responding to this advertisement mention **GLEANINGS**.

NEW YORK.

FOREIGN ORDERS SOLICITED.

NEW JERSEY.

EASTERN * DEPOT

(Bees.) —FOR— (Queens.)

EVERYTHING USED BY BEE-KEEPERS.

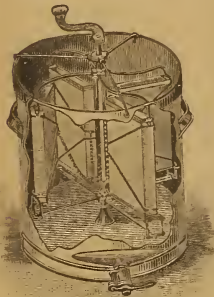
EXCLUSIVE MANUFACTURER OF THE
STANLEY AUTOMATIC HONEY-EXTRACTOR.
Dadant's Foundation, Wholesale and Retail.
WHITE POPLAR OR BASSWOOD SECTIONS.
One-Piece, Dovetail, or to Nail, Any Quantity, Any Size.

COMPLETE MACHINERY—FINEST WORK.

Send for *Handsome Illustrated Catalogue, Free.*

E. R. NEWCOMB, Pleasant Valley, Dutchess Co., N. Y.

In responding to this advertisement mention **GLEANINGS**.



MASS.



CONN.

FOUNDATION.

The foundation we sell is fresh made, and is not over two weeks from the mill. Fresh-made foundation is much the best, other manufacturers to the contrary notwithstanding. All orders filled promptly (in the season). Address for prices, etc.,

F. A. SALISBURY, Syracuse, N. Y.

1tfdb

In responding to this advertisement mention **GLEANINGS**.

Great Reduction in Prices.



We now sell our premium No. 1 one-piece sections at \$3 per M; No. 2 at \$2. A *Liberal Discount* will be made on larger orders. Dealers would do well to get our figures on sections and wood separators before buying elsewhere.

Berry boxes,

baskets, and crates of the most approved styles at the lowest rates. Send for catalogue with *Reduced Prices*. Address as in cut above. 1-12db

In responding to this advertisement mention **GLEANINGS**.

BRADNER'S FACTORY FOR—

BEE - KEEPERS' SUPPLIES.

—WHOLESALE AND RETAIL.

Best Goods at Low Prices. Price List free.

6-8-10d

J. J. BRADNER, Findlay, Ohio,

✂ ALSIKE. ✂

WHOLESALE AND RETAIL; BEST OF SEED.

↳ALSO GARDEN SEEDS.↳

C. M. GOODSPEED, 4-50d THORN HILL, N. Y.

HALF-PRICE!

SOMETHING FOR THE GOOD WIFE.

Any one sending us \$3.50 for 1000 **FIRST-CLASS SECTIONS** or \$4.00 worth of other supplies may have one of our **SELF-HEATING CHARCOAL SMOOTHING-IRONS** for \$1.50, which is *half-price*. For description, send for circular, or see adv't in **GLEANINGS** for Oct. 15, 1888.

SMITH & SMITH,

7tfdb

Kenton, Hardin Co. Ohio.

In responding to this advertisement mention **GLEANINGS**.

Italian Bees, Queens, and Eggs

From Light Brahma and Wyandotte Poultry. Eggs, two dollars for thirteen.

One untested queen, \$1.00; three for \$2.00.

Price List Free. Address

6-16d

H. G. FRAME, North Manchester, Ind.,